

# EVERYMAN'S ENCYCLOPAEDIA

IN TWELVE VOLUMES  
VOLUME NINE



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# ABBREVIATIONS

The titles of subjects, which are printed first in bold type, have been abbreviated within each article to the initial letter or letters.

<b>ac.</b> , acre(s).	<b>lb.</b> , pound(s).
<b>agric.</b> , agricultural.	<b>l. b.</b> , left bank.
<b>ambas.</b> , ambassador(s).	<b>long.</b> , longitude.
<b>Amer.</b> , American.	<b>m.</b> , mile(s).
<b>anct.</b> , ancient.	<b>manuf.</b> , manufacture(d).
<b>ann.</b> , annual.	<b>M.E.</b> , Middle English.
<b>arron.</b> , arrondissement.	<b>min.</b> , minute(s).
<b>A.-S.</b> , Anglo-Saxon.	<b>Mod. E.</b> , Modern English.
<b>A.V.</b> , Authorised Version.	<b>m.p.h.</b> , miles per hour.
<b>b.</b> , born.	<b>mrkt tn.</b> , market town.
<b>Biog. Dic.</b> , Biographical Dictionary.	<b>MS., MSS.</b> , manuscript(s).
<b>bor.</b> , borough.	<b>mt, mts.</b> , mount, mountain(s).
<b>bp.</b> , birthplace.	<b>N.</b> , north; northern.
<b>Brit.</b> , British.	<b>N.T.</b> , New Testament.
<b>c.</b> , about.	<b>O.E.</b> , Old English.
<b>C.</b> , Centigrade.	<b>O.F.</b> , Old French.
<b>cap.</b> , capital.	<b>O.T.</b> , Old Testament.
<b>cent.</b> , century (7th cent.).	<b>oz</b> , ounce(s).
<b>chem.</b> , chemistry.	<b>par.</b> , parish.
<b>co.</b> , county.	<b>parl.</b> , parliamentary.
<b>com.</b> , commune.	<b>pop.</b> , population.
<b>cub. ft.</b> , cubic feet.	<b>prin.</b> , principal.
<b>d.</b> , died.	<b>prof.</b> , professor.
<b>Dan.</b> , Danish.	<b>prov.</b> , province; provincial.
<b>dept.</b> , department.	<b>pub.</b> , published; publication.
<b>dimin.</b> , diminutive.	<b>q.v.</b> , Lat. <i>quod vide</i> , which see.
<b>dist.</b> , district.	<b>R., riv.</b> , river.
<b>div.</b> , division.	<b>R.A.F.</b> , Royal Air Force.
<b>E.</b> , east; eastern.	<b>Rep. of Ireland</b> , Eire.
<b>eccles.</b> , ecclesiastical.	<b>R.N.</b> , Royal Navy.
<b>ed.</b> , edition; edited.	<b>Rom.</b> , Roma.
<b>educ.</b> , educated.	<b>r.p.m.</b> , revolution per minute.
<b>e.g.</b> , for example.	<b>R.V.</b> , Revised Version.
<b>Ency. Brit.</b> , <i>Encyclopaedia Britannica</i> .	<b>S.</b> , south; southern.
<b>Eng.</b> , English.	<b>sec.</b> , second(s).
<b>estab.</b> , established; establishment.	<b>sev.</b> , several.
<b>fl.</b> , flourished.	<b>Sp.</b> , Spanish.
<b>Flem.</b> , Flemish.	<b>sp. gr.</b> , specific gravity.
<b>fort. tn.</b> , fortified town.	<b>sq. m.</b> , square miles.
<b>Fr.</b> , French.	<b>temp.</b> , temperature.
<b>ft.</b> , feet.	<b>ter.</b> , territory.
<b>Ger.</b> , German.	<b>tn.</b> , town.
<b>Gk.</b> , Greek.	<b>trans.</b> , translated; translation.
<b>gov.</b> , government.	<b>trib.</b> , tributary.
<b>Heb.</b> , Hebrew.	<b>U.K.</b> , United Kingdom.
<b>hist.</b> , history.	<b>U.N.</b> , United Nations.
<b>horticult.</b> , horticultural.	<b>univ.</b> , university.
<b>h.p.</b> , horse-power.	<b>U.N.O.</b> , United Nations Organisation.
<b>H.Q.</b> , headquarters.	<b>urb.</b> , urban.
<b>hr(s)</b> , hour(s).	<b>U.S.A.</b> , United States of America.
<b>in.</b> , inch(es).	<b>vil.</b> , village.
<b>inhab.</b> , inhabitant(s).	<b>vol.</b> , volume.
<b>is.</b> , island(s).	<b>W.</b> , west; western.
<b>It.</b> , Italian.	<b>Wm.</b> , William.
<b>Jap.</b> , Japanese.	<b>yd(s)</b> , yard(s).
<b>jour.</b> , journal.	
<b>Lat.</b> , Latin.	
<b>lat.</b> , latitude.	



**Mura**, see SLOVENIA.

**Murad**, see AMURATH.

**Murakami**, city of Niigataken, Japan, 32 m. NE. of Niigata. A centre of agriculture, it has metal and chemical industries. Pop. 33,000.

**Mural Decoration** (Lat. *murus*, wall), art of adorning walls by means of surface painting in fresco, oils, or encaustic, by mosaic compositions, and by carving in wood, terra-cotta, stone, or marble. The term is also extended to the decorative treatment of vaults and ceilings. In early Egyptian art interior walls were covered with figure and other designs in low relief, or deeply incised, and were gaily coloured. Wonderful examples of M. D. of the Mycenaean Age have been discovered at Knossos. In Assyria walls were decorated with sculptured dadoes and coloured friezes, representing groups of figures. The sculptured friezes and metopes of ancient Greece, used as decorations for temples and public buildings, are of incomparable beauty. The Romans employed 3 principal methods of M. D.: painting in fresco, mosaics, and marble incrustations. Some remains of mural paintings have been preserved at Pompeii. In later cents. It. artists painted in oils on plaster. Cimabue and Giotto painted in fresco, leading the way in a form of M. D. which superseded all others. During the Middle Ages mural painting was used extensively in churches until the introduction of large areas of stained glass. In modern times the art of M. D. has declined, save in special cases such as saloons of great liners, restaurants, and schoolrooms. See also FRESCO PAINTING; MOSAIC; TAPESTRY. See A. L. Baldry, *Modern Mural Decoration*, 1902; F. H. Jackson, *Mural Painting*, 1904; J. C. Wall, *Medieval Wall Paintings*, 1914; H. Feibusch, *Mural Painting*, 2nd ed., 1947; E. W. Anthony, *Romanesque Frescoes*, 1951.

**Murano**, suburb of Venice (q.v.), in Veneto (q.v.), Italy. It is built on sev. is. in the lagoon, and has been famous for its glass since medieval times (see GLASS). The industry, which had been in decline since the 18th cent., has been revived, and optical glass is also now made. There is a museum of glass, and the Byzantine church of S. Maria e Donato has some fine 12th-cent. mosaics. Pop. 8600.

**Murat, Joachim** (1767-1815). Fr. soldier and King of Naples, son of an innkeeper, b. La Bastide-Fortunière, near Cahors, France. He entered the Fr. Army, in which he served under Napoleon in Italy and Egypt, distinguishing himself at the battle of the Pyramids (1798). For his part in the 13th Vendémiaire he was made a lieutenant-colonel and first aide-de-camp to Napoleon, and after Aboukir was made a general of div. He dispersed the Council of Five Hundred at St Cloud in 1799, and in the following year married

Napoleon's youngest sister, Marie Armonciade Caroline. He was made governor of the Cisalpine rep. in 1801, and after taking part in the battles of Jena, Eylau, Austerlitz, etc., was made Grand Duke of Berg and Cleves for his share in the last-named. In the invasion of Spain in 1808 he commanded the Fr. armies, but shortly afterwards Napoleon gave him the crown of the Two Sicilies. He styled himself King Joachim-Napoleon and his rule was generally liberal in character; but he



JOACHIM MURAT

soon offended Napoleon by his sumptuous court life and by the number of marshals he created. In 1812, however, he rallied to his old master and commanded the cavalry of the grand army which invaded Russia; but after the battle of Leipzig he hurried back to his kingdom and, having broken with Napoleon, made overtures to Austria and Great Britain. When Napoleon escaped from Elba M. thought he could himself win all Italy and then treat with Napoleon as an equal, but he was checked at Ferrara and routed at Tolentino. He then organised an expedition to Calabria against the restored Bourbons, but his popularity had vanished, and he was captured and shot at Pizzo. See lives by J. Chavanan and G. Saint-Yves, 1905; H. Weil, 1909-10; A. H. Atteridge, 1911; A. de Tarle, 1914; also L. Monnier, *Murat et le Congrès de Vienne*, 1937.

**Muratori, Lodovico Antonio** (1672-1750), It. scholar, antiquary, and historian, b. Vignola, near Modena. In 1694 he became director of the Ambrosian College and Library at Milan, and while there pub. *Anecdota Graeca* and *Anecdota Latina*, previously unedited fragments. Recalled to Modena (1700), he

## Murav'ev

became librarian and archivist to Duke Rinaldo I. His 3 chief works are *Rerum italicarum scriptores*, 1723-51, dealing with the sources of medieval It. hist.; *Antiquitates Italicae medii aevi* (1738-1743), describing the constitution, customs, and thought of the Middle Ages; and *Annali d'Italia*, 1744-9, first complete ed. 1753-6, a critical hist. of Italy from the birth of Christ down to 1750. His collected works were pub. 1767-80 and 1790-1810 and his letters, ed. by M. Cárnpori, 1901-22. See lives by F. G. Muratori, 1756, and G. Bertoni, 1926.

**Murav'ev, Count Mikhail Nikolayevich** (1796-1866), Russian administrator, strong opponent of Alexander II's reforms. In 1863-5 he was Governor-General in Vilna; he ruthlessly suppressed the Polish rising of 1863.

**Murchison, Sir Roderick Impey** (1792-1871), geologist, b. Tarradale, Ross-shire, Scotland. He served in the Peninsular campaign, being present at the battle of Corunna. He left the army in 1816 and devoted himself to geology. He studied the older rocks of large parts of England and Scotland, and later travelled in Europe, studying the geological structure of the Alps. He advised the Russian Gov. on geological matters and succeeded de la Beche as director general of the Geological Survey of the U.K., 1856. M.'s chief title to fame was the estab. of the Silurian system and his exposition of the Permian, Devonian, and Laurentian systems. Amongst other works he pub. *The Silurian System*, 1838, and *The Geology of Russia in Europe and the Urals*, 1845. See life by Sir A. Geikie, 1875.

**Murchison, gold-field of W. Australia**, N. of Lake Austin, 21,600 sq. m. in area. Cue is the cap. of the dist., 540 m. NNE. of Perth. The M. R. forms the E. boundary of M. Pop. 1800.

**Murchison Falls**, in Uganda on the Victoria Nile about 20 m. from its exit from Lake Albert. At these falls there is a drop of the riv. of about 130 ft, the whole volume of the Nile passing through a rock-cleft only 19 ft wide in the elevated scarp at its narrowest point and then thundering down 401 ft in a series of splendid cascades. In the pool below are thousands of enormous fish and crocodiles. M. F. is easily reached by road or by steamer from Butiaba. The surrounding dist. is immensely rich in the characteristic fauna of E. Africa, including elephants, lions, rhinoceros, buffaloes, monkeys, and an infinite variety of antelope. During the winter season the Kenya and Uganda Railways and Harbours organises special excursions. See H. B. Thomas and Robert Scott, *Uganda*, 1935.

**Murcia**: 1. Region in SE. Spain, comprising the provs. of M. and Albacete (q.v.). It was once a kingdom, which arose after the defeat of the last Visigoth king, Roderic (q.v.), and which, although Christian, was trib. to the Moors. The Moors later absorbed it, and, finally, in 1142 it was taken by Ferdinand III and joined to Castile (q.v.). Area 10,109 sq. m.; pop. 1,169,300.

2. Sp. prov. in the region of M., with

## Murder

a coastline on the Mediterranean. It is watered by the Segura and its tribs., the Sangonera and Quipar, and is very mountainous in the S. and E. Oranges, olives, palms, mulberry-trees, and vines are grown, and there are large deposits of salt and minerals, especially lead and zinc. Area 4370 sq. m.; pop. 766,300.

3. Sp. city, cap. of the prov. of M., on the Segura, in a celebrated *huerta* (garden country). It has a 14th-16th-cent. cathedral, with an 18th-cent. Baroque façade, and other old churches, but the greater part of the city has been rebuilt since the 18th cent. There is a univ.,



MURCIA: THE CATHEDRAL

1915. Textiles, iron, copper, and gunpowder are manuf. Pop. 223,650 (city proper. 45,000).

**Murder**. The generally accepted definition of M. in Eng. law is that of Coke: 'when a person of sound memory and discretion unlawfully killeth any reasonable creature in being, and under the king's peace with malice aforethought, either express or implied' (see MALICE). Paraphrased this means: (1) That within limits children and idiots, or lunatics, cannot be guilty of M. But a lunatic who kills another person may be confined in Broadmoor or some other criminal lunatic asylum during the royal pleasure (see also INFANT and CRIMINAL LAW). (2) That the mere killing of another by whatsoever means, whether by an act or omission likely to result in death, raises a presumption of felonious homicide which the accused must rebut by showing some justification (see HOMICIDE) or excuse (as, for example, self-defence). (3) That it is not M. to kill an infant in the womb, though such act of procuring abortion is punishable as a felony with penal servitude to the extent of life. But where a child born alive (in Scots law this

is proved by anyone who heard the child cry; in Eng. law by medical testimony that it breathed) afterwards dies by reason of drugs or wounds received while in the womb (*a fortiori* afterwards), those who administered such drugs or wounds are, according to the better opinion, guilty of M. (4) That it is not M. to kill an alien enemy actually participating in warfare against the state, but M. committed by a Brit. subject upon a foreigner (not an enemy) abroad is an extraditable crime, and the murderer can be punished by an Eng. court. (5) That the guilty state of mind essential to M., though generally one of sedate and deliberate intention to kill, may be inferred from any wanton or cruel act against another likely to result in death (*see also* MANSLAUGHTER and MALICE). 'Constructive' M. means the killing of a person while engaged in committing another felony; for example, if a burglar fearing capture rushes so violently past an inmate of the house as to cause his death, that will be M. however unintentional the killing. But in practice the death penalty is never inflicted in a clear case of merely 'constructive' M. There is no *crime passionnelle* in Eng. law, for no provocation, however great, will justify killing, though if there be no *express* malice (q.v.), the charge will be reduced to manslaughter.

Attempted suicide or self-murder is a felony punishable by imprisonment, but it is a commonplace of Eng. criminal law that if 2 people agree to commit suicide together and 1 survives, the survivor is guilty of M. Accessories before the fact to M. are equally guilty and punishable with the prin. offender; and an attempt to commit M. is punishable with life imprisonment. The punishment for M. is life imprisonment, except in certain cases called 'capital' M. (*see* CAPITAL PUNISHMENT). In A.-S. times it was redeemable by payment of *werild* (q.v.), or blood money, to relatives of the murdered man. In some of the United States M. is classified into degrees. For example, M. by poison or by any premeditated design is M. in the first degree, and punishable with death; all other kinds of M. are said to be in the second degree, and punishable with imprisonment. For recent discussion on the question of the suspension or abolition of the death

penalty, and the suggestion that Eng. law and practice should recognise degrees of M., *see* CAPITAL PUNISHMENT. *See also* CRIMINAL LAW.

**Murdock, William** (1754-1839), engineer and inventor, b. Auchinleck, Ayrshire. In 1792 he used coal gas as an illuminant in his own house, and 10 years later it was used for lighting Soho. He also experimented on a high-pressure locomotive, and in 1784 made a small locomotive steam engine. He improved greatly on Watt's steam engine, and invented apparatus by which it was possible to use compressed air, devising the first oscillating steam engine.

**Mure, Sir William** (1594-1657), poet, b. Rowallan, Ayrshire. He became M.P. in Edinburgh in 1643, the following year being wounded at Marston Moor. He wrote a poetical trans. of Boyd's *Hecatombe Christiana*, 1628, *The True Crucifix for True Catholics*, 1629, a version of the Psalms, *The History and Descent of the House of Rowallan* (pub. 1825), and sev. miscellaneous poems.

**Mures River**, riv. in Rumania and Hungary, and a trib. of the R. Tisza, which it joins at Szeged. It rises in the Carpathians and is 450 m. long.

**Muret, or Muretus, Marc Antoine** (1526-1585), Fr. humanist, b. Muret, near Limoges. In 1563 he went to live in Rome, where he lectured and taught civil law till 1584, when he retired. He ed. Lat. authors and wrote *Orationes, Epistolae*, 1838, and *Variarum Lectionum Libri XIX*. His collected works were ed. by C. H. Frotscher, 1834-41.

**Muret**, Fr. tn, cap. of an arron., in the dept of Haute-Garonne, at the confluence of the Garonne and the Louge. In 1213 the Albigenses (q.v.), supported by the Catalans, were defeated here by the Crusaders of Simon IV de Montfort (*see* under MONTFORT). M. produces a white wine. Pop. 4400.

**Murfreesboro**, city and co. seat of Rutherford co., Tennessee, U.S.A., 29 m. SE. of Nashville. It lies in an agric. dist., and carries on a considerable trade in cotton, grain, livestock, timber, etc. It is the seat of Middle Tennessee State College. M. was settled in 1811, and incorporated in 1817. Near by was fought the battle of Stones R. in 1862. Pop. 13,050.

against Mary at her trial. He was murdered at Linlithgow by James Hamilton of Bothwellhaugh, and was buried in St Giles's Cathedral, Edinburgh.



JOHN MURRAY (1778-1843)

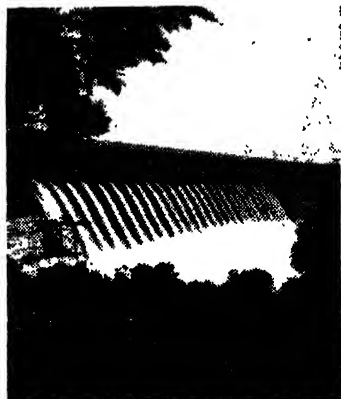
Murray, John, name of sev. generations of Eng. publishers, and one that will long remain associated with many a classic writer of Eng. literature. John M. (1745-93), the founder, b. Edinburgh, first served as an officer in the Royal Marines. In 1768 he purchased the book-selling business of Wm Sandby, and thenceforth became a bookseller and publisher at 32 Fleet Street. His son John M. II (1778-1843), Byron's publisher, founded, 1809, the *Quarterly Review*, and moved the firm to Albemarle Street, where they operate to-day. John M. III (1808-92) founded the *M. Handbooks* for travellers.

Murray, Sir John (1841-1914), Canadian naturalist and geographer, b. Coburg, Ontario, and educ. in Ontario, the High School, Stirling, Scotland, and at Edinburgh Univ. He was one of the naturalists who made the famous voyage in the *Challenger*, and was appointed editor of the reports of the expedition. He also took part in the explorations in the *Triton* and *Knight Errant* to the Farøe Channel. He wrote books and articles on geographical and marine subjects.

Murray, Lindley (1745-1826), Anglo-Amer. grammarian, b. Swatara, Pennsylvania. He was called to the Bar in 1765. In 1784 he settled in England and devoted himself to literature. His first book was *Power of Religion on the Mind*, 1787. Later he wrote *English Grammar*, 1795, which went through 200 eds. before 1850, long a standard work and his chief claim to a place in literature. These were followed by various works, such as Eng. readers, etc. See *Memoirs in Letters written by Himself*, 1826.

Murray, William, see MANSFIELD, W.  
Murray, or Hume, prin. riv. of Australia, rising in the Australian Alps and flowing W. to the sea through the shallow Lake Alexandrina. For the greater part of its

course it forms the boundary between New S. Wales and Victoria. In conjunction with the Darling it drains almost the entire SE. quarter of the continent. Its total length is about 1600 m. Owing to sandbars at its mouth it is inaccessible for large vessels but navigable for small steamers. Its chief tribs. are the Murrumbidgee, Lachlan, and Darling. The water of the M. is used for irrigation purposes, being dammed at the Hume Reservoir, where the Mitta Mitta joins it, so that it is available in the dry season. The Hume Reservoir stores 1,382,000 ac. ft of water (to be enlarged to 2,500,000 ac. ft), which runs off a catchment area of about 6000 sq. m. of mountainous country on the border of Victoria and New S. Wales. It is composed of an earthen embankment 411 ft long and a massive concrete wall, forming the spillway and outlet works, across the riv. for 1042 ft on the New S. Wales side. On the Victorian side an earthen embankment 3827 ft long brings the total length to 1 m. The reservoir forms a vast inland lake of 33,000 ac.—3 times the size of Sydney Harbour. The large volume of water stored in it ensures an adequate flow of water in the irrigated areas in the lower reaches of the M. R. In 1949 the govs. of New S. Wales and Victoria agreed on a scheme for the diversion of the headwaters of the Snowy R. (q.v.) across the Australian Alps into the Upper M. and Tumut R.s in connection with a vast hydro-electric irrigation project now in course of construction by the Snowy Mts Hydro-electric Authority (q.v.). See J. M. Holmes, *The Murray Valley*, 1948.



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MURRAY RIVER  
The Concrete Wall.

Murray Bridge, tn. of S. Australia, on the R. Murray, 50 m. SE. of Adelaide, on the Adelaide-Melbourne road and railway line. Centre of an extensive dairying

## Murraysburg

industry, its other pursuits are agricultural and pastoral. It is a popular tourist resort. Pop. 4000.

**Murraysburg**, vil. and div. of Cape Prov., S. Africa. The vil. is 50 m. WNW. of Graaf Reinet (q.v.). Important wool-producing centre. Pop.: Whites, 659; Others, 1673.

**Murree**, tn of W. Pakistan, some 40 m. NE. of Rawalpindi. M. is a well-known hill station (altitude 7500 ft) with fine views of the snow mts of Kashmir, and is the site of one of the Lawrence schools for the children of soldiers.

**Mürren**, vil. of the Bernese Oberland, Switzerland, above Lauterbrunnen, from where it is reached by a funicular railway. It is situated at an altitude of 5115 ft, and affords a fine view of the Jungfrau. M. is a popular resort and winter sport centre.

**Murrhine**, or **Myrrhine**, **Vases**, celebrated vessels of antiquity, brought from Asia to Rome by Pompey after his victory over Mithridates.

**Murrumbidgee**, riv. of New S. Wales, rising on the NE. of the Australian Alps, and flowing 1000 m. westwards to join the Murray, 90 m. SE. of the mouth of the Darling. It is navigable for 500 m. during the wet season.

**Murry**, John Middleton (1889-1957), critic, b. Peckham, London. He was educ. at Christ's Hospital and Brasenose College, Oxford, and was on the staff of the *Westminster Gazette*, 1912-13, being art critic, 1913-14. During the First World War he served in the political intelligence div. of the War Office, and was awarded the O.B.E. Editor of the *Athenaeum*, 1919-21, and of the *Adelphi*, 1923-30, he became Clark lecturer at Cambridge Univ. in 1924. His writings largely consist of literary criticism and criticism of existing social institutions. Among his many works are *Aspects of Literature*, 1920, *The Things We Are*, 1922, *Things to Come*, 1928, *God*, 1929, *Son of Woman* (a study of D. H. Lawrence), 1931, *The Necessity of Communism*, 1932, *Between Two Worlds* (an autobiography), 1934, *The Defence of Democracy*, 1939, *The Betrayal of Christ by the Churches*, 1940, *Christocracy*, 1942, *Adam and Eve*, 1944, and *The Free Society*, 1947. In 1919 he pub. a collection of *Poems*. He collaborated with Ruth E. Mantz in a biography of his wife, Katherine Mansfield (q.v.), in 1933, and also wrote studies of Blake, 1933, Shakespeare, 1936, Keats, 1949, and Swift, 1954. He rejected criticism which lacks that reference to life as a whole which, in his later years, he came to regard as essential to all criticism, and considered that 'the function of true criticism is to establish a definite hierarchy among the great artists of the past, as well as to test the production of the present; by the combination of these activities it assists the organic unity of all art.' It is said that the character of Denis Burlap in Aldous Huxley's *Point Counter Point* is founded on M.'s personality. See study by R. Heppenstall, 1934; see also Katherine Mansfield, *Letters to John Middleton Murry*, 1951.

## Muscadet

**Mursa**, see **OSIJEK**.

**Murshidabad**, city of W. Bengal state, India. The city lies 115 m. N. of Calcutta, and extends along both sides of the sacred R. Bhagirathi. M. was the residence of the Nawab Nazims of Bengal, of whom Suraj-ud-Daula, whose name is connected with the Black Hole of Calcutta, was one. M. was formerly a great centre for ivory carving and embroidery, but few craftsmen remain. Both Clive and Warren Hastings stayed here, and the pleasure garden near the Pearl Lake is still known as the Company Bagh.

**Murten** (Switzerland), see **MORAT**.

**Murtoza**, tn of Portugal, in Aveiro dist., on the Aveiro lagoon, 6 m. N. of Aveiro (q.v.). It has fishing and salt industries. Pop. 3000.

**Murviadro**, see **SAGUNTO**.

**Murwillumbah**, tn on Tweed R., 581 m. N. of Sydney, close to the New S. Wales-Queensland border in Australia. M. is 20 m. from the coast and the main rural pursuits are banana-growing and dairying. Pop. 6800.

**Mus**, **Mush**, or **Moush**, prov. (il) of Turkey, 55 in. W. of Van Gölü Lake. Pop. 136,248.

**Musa**, **Abu Abdallah Mohammed Ben**, Arabian mathematician, the first of his countrymen to write on the science of algebra, to whom Europe is indebted for its introduction.

**Musa**, **Antonius**, see **ANTONIUS MUSA**.

**Musa**, **Ibn Nusair**, or **Noseir** (AD 640-715), was appointed Governor of Irtiqiya (Rom. Africa) in 698 or 699 by the brother of the caliph, who was Governor of Egypt; and from this base he conquered N. Africa. He left as his deputy in the extreme W. his freedman Tariq, who began in 710 a successful invasion of Spain. M. was jealous, followed him in 712, and conquered most of the country up to Saragossa, leaving Spain in 714. On reaching Damascus he found that he was not in favour with the caliph, though the tales of his last years are legendary.

**Musaeus** (late 5th cent. AD), Gk poet, author of a short epic entitled *Hero and Leander*, a work of great charm. There is a Ger. ed. by A. Ludwig, 1912, and a trans. by F. L. Lucas, 1949.

**Musäus**, **Johann Karl August** (1735-1787), Ger. novelist, b. Jena. His first work, entitled *Grandison der Zweite*, was pub. in 1762 and rewritten about 20 years later under the title of *Der deutsche Grandison*, its object being to satirise the Eng. novelist Richardson's hero. His most important work was *Völkermärchen der Deutschen*, a series of satirical tales, 1782-6. See M. Müller, J. K. A. *Musäus*, 1867; also Carlyle's trans. and biographical notices.

**Musca** (Lat. 'fly'), constellation situated between Chamæleon and the S. Cross, originally called *Apis Musca Australis*. It contains 20 stars catalogued as brighter than magnitude 6 and hence, under ideal conditions, visible to the naked eye, but probably only about half of these would usually be so visible.

**Muscadet Wine** is made from the M. grape grown largely in the Nantes dist. of

the Lower Loire. The M., which gives a sound ordinary wine, must not be confused with the muscat (q.v.); it is the *gamay blanc* or melon of Burgundy.

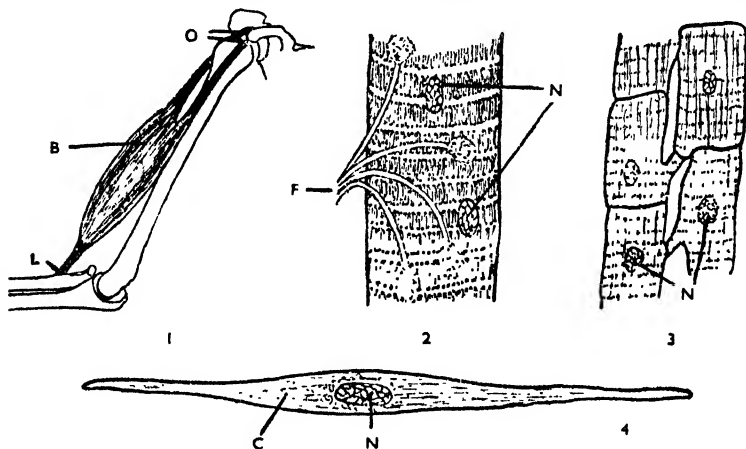
**Muscardine**, or **Silkworm Rot**, disease which causes much loss among silkworms. It is caused by a fungus, many allied species of which are parasites on Lepidoptera, both in the caterpillars and the perfect insects.

**Muscat**, tn and seaport on the SE. coast of Arabia, cap. of the sultanate of Muscat and Oman (q.v.). It is under Brit. political influence. The climate is hot and unhealthy. Dates are the prin.

Mississippi R. (bridged), 25 m. WSW. of Davenport. It manufs. pearl buttons (from riv. mussel shells), steel pulleys, pumps, and castings. Pop. 19,000.

**Musci**, see **MOUSES**.

**Muscle**, structure of the body capable of causing motion by the contraction of its fibres. Muscular tissue consists of elongated cells or fibres. The fibres making up some of the M.s consist of protoplasmic material with transverse stripes; these are called striped or striated fibres. Others possess no transverse markings, and are therefore known as non-striated or plain muscular fibres.



MUSCLE

1. B, biceps muscle; O, origin, attachment to scapula by two tendons; L, insertion on radius.
2. Diagrammatic representation of nerve, F, and its end-plates on a striated muscle fibre; N, nucleus.
3. Connected cells of cardiac muscle (diagrammatic); N, nucleus.
4. Unstriated muscle fibre (diagrammatic); C, cytoplasm; N, nucleus.

**export.** M. was taken by the Portuguese in 1508 and remained under their rule till 1650, when they were finally expelled. M. was once an important, prosperous tn, but has been falling into decay for many years and most of its former trade now goes to the sister port of Matrah, which is the starting point of the trade route to the interior; but M. still remains the seat of gov. Pop. of M., about 3500; of Matrah, 8500.

**Muscat**, name of the most highly scented genus of *Vitis vinifera*, the European vine. It is generally grown for dessert grapes, but the M. flavour is conspicuous in the Fr. Muscat de Frontignan and the Portuguese Setubal. The name Muscatel is given to a cheap, sparkling wine with elder-flower essence imitating the M. flavour.

**Muscatine**, city, cap. of Muscatine co., Iowa, U.S.A., and rail centre, on the

Every muscular fibre has the property of contracting, that is, on the receipt of a certain stimulus a chemical change is brought about, resulting in a change in the elastic tension of the cell. An increase of tension occurs in the points of attachment of the cell to neighbouring tissues, which ordinarily move under the strain, so that the length of the fibre decreases, while its diameter becomes proportionately bigger. In some M.s this contraction is voluntary; that is, it is the result of an act of will. This modification of consciousness is accompanied by a certain mode of activity in some of the cells of the large brain, or cerebrum. By this means an impulse is communicated to the nerve-fibres supplying the M.s and is conveyed to the M. by end-plates or expansions of the nerve-fibres situated on the surface of the muscular fibres. Other M.s are not under the control of the will.



Such are the M.s causing the movements of the stomach and other parts of the alimentary canal. They are called involuntary M.s, and are made up of non-striated fibres, except the cardiac M., which resembles voluntary M.s in being striated. It is, however, not always possible to classify M.s as voluntary and involuntary, for some of them, such as those of the tongue, larynx, and eyeballs of the Vertebrata, and certain M.s of Arthropoda, are intermediate in type. The capacity of a M. for responding to a stimulus is termed its excitability. In cardiac M. the extent of contraction does not depend upon the intensity of the stimulus, but in M.s attached to the bones a relation is maintained between contraction and stimulus. If, however, a M. has been repeatedly contracted without much intermission, a stimulus does not evoke the usual degree of contraction. This condition is called muscular fatigue, and further evidence of it is afforded by the increasingly long periods of relaxation. Eventually the M. will fail to respond at all to the stimulus. Muscular fatigue is due to the formation of lactic acid from the glycogen in the M. cells. This glycogen is produced by the action of insulin (q.v.) on the sugar dissolved in the blood, and, apparently by an internal rearrangement of the molecule, glycogen is converted into lactic acid. This change accompanies the contraction of the M., and heat is produced during the process. A young athlete, running as fast as he can, produces about 4 grammes of lactic acid per sec.

During relaxation some of the protein in the M. cell combines with and neutralises the lactic acid, and recovery from fatigue is effected by oxidation of the product. This process results in the re-formation of protein, the conversion of some of the lactic acid into glycogen, and the complete oxidation of the remainder with the elimination of carbon dioxide and the production of heat.

When exercise is moderate the amount of lactic acid in the blood reaches its maximum after a few minutes and is quickly removed by the increase of the oxygen supply by deep and rapid breathing. If exercise be very strenuous the lactic acid increases until there are symptoms of distress, and eventually a type of *rigor mortis* may be caused. The fleshy part of a M. is usually attached at each end to bands, or tendons, of white fibrous tissue, which is itself non-contractile, but in Vertebrata serves to join the M. to some bone. The attachment which is more fixed is called the origin; that which is more movable is called the insertion. Thus the biceps has 2 origins, in the coracoid process and the glenoid cavity; its insertion is in the tuberosity of the radius, or the outer bone of the forearm. Every M. is supplied with blood-vessels, and lymphatics to carry the substances for repair of tissue, for the combustion which liberates the energy resulting in contraction, and for the removal of waste products.

See also CLONUS; REFLEX; TENDON OF ACHILLES.

**Muscovy**, Russian 14th–18th-cent. state. Princes of Moscow first appeared as vassals of the Grand Princes of Vladimir (q.v.) in the 13th cent. after the Mongol-Tatar conquest (see BATU and GOLDEN HORDE). Thanks to its advantageous geographical position in the centre of the then NE. (now central) Russia (which facilitated commercial development and sheltered it from Tatar raids), and to the consistent and tenacious policy of its princes, Moscow in the 14th cent. gradually achieved supremacy over neighbouring principalities and replaced Vladimir as the cap. of the Grand Principality. The most outstanding rulers of this period were Ivan the Money-bag (q.v.) and Dmitriy Donskoy (q.v.), who achieved the first victory over the Tatars in 1380. The struggle against the Tatar overlordship continued until it was finally abolished in 1480 by Ivan III (q.v.). The territorial expansion of M. continued until it absorbed all Russian lands (including the reps. of Novgorod in 1478, Vyatka in 1489, and Pskov in 1510, and the Grand Principalities of Tver' in 1485 and Ryazan' in 1521 (qq.v.)) which had not been annexed by Lithuania (q.v.). In 1547 Ivan the Terrible (q.v.) assumed the title Tsar (q.v.) of All Russia. During his reign the Tatar Khanates of Kazan', Astrakhan', and Siberia were conquered, and M. became a multi-national state. Soon afterwards the house of Iturikidæ (q.v.) died out, and the country went through the Time of Troubles. The new house of Romanov (q.v.) continued the policies of their predecessors (conquest of the rest of Siberia, incorporation of the Ukraine). Peter the Great (q.v.), the last tsar of M. and the first Russian emperor (from 1721), inaugurated a new epoch of Russian hist. M. was the cradle of the Great Russian people (see GREAT RUSSIANS). Politically it was an autocracy limited by the Boyars' Duma (see BOYARS and DUMA) and the Zemskiy Sobor (q.v.). Its legal system was successively developed in the Codes of 1497, 1550, and 1649, which gradually centralised administration and introduced peasant serfdom. Culturally M. was isolated from the rest of Europe, first through Tatar domination, and after the Florentine Union (see EASTERN ORTHODOX CHURCH) in 1439 and the fall of Constantinople in 1453 by antagonism between the Orthodox and the Rom. Catholic Churches. The political ideology of the Muscovite state rested on the conceptions of gathering the Russian land' (see KIEVAN RUSSIA) and 'Moscow—the third Rome.'

**Muscovy, or Musk, Duck** (*Cairina moschata*), species of wild duck native to central and S. America, where it nests in the trees of forest swamps. It is often reared in poultry yards of European countries as an ornamental bird for lakes and parks. It is also called Barbary duck.

**Musel, El**, see GLJÓN.

**Muselier, Emile Henri** (1882– ), Fr. admiral, b. Marseilles and educ. at the Brest naval school. He was a corvette

captain in 1918, and, after the First World War, became frigate captain (1922), rear-admiral (1933), and vice-admiral (1939). Among his commands before the Second World War were those of the defences of Cherbourg and of the second cruiser div. in the Mediterranean; in 1938 he was appointed admiral commanding the navy and defences of Marseilles. On the collapse of France in 1940 M. joined de Gaulle (July 1940), who made him commander-in-chief of the Free Fr. naval forces (1940-2), and of the Free Fr. air forces (1940-1). M. led the Free Fr. naval forces in the occupation of Saint-Pierre and Miquelon Is. against the representatives of the Vichy Gov. there. He was made national commissioner of navy and merchant navy in the Fr. National Committee, but resigned in Mar. 1942 and in the following year became assistant to Gen. Giraud (q.v.) in Algiers. After the war he was chief of the Fr. naval delegation of the military mission for Ger. affairs till 1945.

**Museo di San Marco** (Florence), see **UFFIZI AND PITTI GALLERIES**.

**Muses**, The, inspiring goddesses of song, who were later thought to preside over the different arts and sciences. They were the daughters of Zeus and Mnemosyne, b. Pieria, at the foot of Mt Olympus. Originally 3, later they were always spoken of as 9 in number. They are (1) Clio, the muse of hist., represented sitting or standing with an open roll of paper, or chest of books; (2) Euterpe, the muse of lyric poetry, with a flute; (3) Thalia, the muse of comedy and of merry or idyllic poetry, appears with a comic mask, a shepherd's staff, or a wreath of ivy; (4) Melpomene, the muse of tragedy, with a tragic mask, the club of Hercules, or a sword; her head is surrounded with vine leaves, and she wears a cothurnus; (5) Terpsichore, the muse of choral dance and song, appears with the lyre and the plectrum; (6) Erato, the muse of erotic poetry and mimic imitation, sometimes also has the lyre; (7) Polymnia or Polyhymnia, the muse of the sublime hymn, appears in a pensive or meditating attitude; (8) Urania, the muse of astronomy, with a staff pointing to a globe; (9) Calliope or Calliopea, the muse of epic poetry, bears a tablet and stylus, and sometimes a roll of paper or a book. The worship of the M. was introduced from Thrace and Pieria into Boeotia; their favourite haunt was Mt Helicon, with the sacred fountains of Aganippe and Hippocrene. Mt Parnassus was likewise sacred to them, with the Castalian spring.

**Museums** (from Gk *mouseion*, temple of the Muses), name now given to buildings where collections of scientific and natural curiosities and works of artistic and literary merit are maintained for the benefit of the public. The first of the kind was the famous univ. building at Alexandria (q.v.), including the Alexandrian Library (q.v.). Here were lodged and entertained the men of learning, each of whom had a handsome revenue. Its foundation is attributed to Ptolemy I (q.v.), c. 283 BC. See also **LIBRARIES**; **NATIONAL GALLERY**;

and articles on individual museums: **ASHMOLEAN MUSEUM**; **BRITISH MUSEUM**; **FITZWILLIAM MUSEUM**; **IMPERIAL INSTITUTE**; **IMPERIAL WAR MUSEUM**; **LONDON MUSEUM**; **LOUVRE**; **PRADO**; **MUSEO DEI SCIENZE MUSEUM**; **VATICAN**; **VICTORIA AND ALBERT MUSEUM**; etc. See A. S. Wittlin, *The Museum*, 1949, and ann. reports of the world's chief M.

**Musgrave, Samuel** (1732-c. 1780), Eng. classical scholar and physician. He wrote *Exercitationes in Euripidem*, 1762, *Two Dissertations*, on 'Gk Mythology', and on 'Newton's Objections to the Chronology of the Olympiads', 1782, *Animal-versions in Sophocles*, 1800, and works on medical subjects. M. helped edit Euripides (4 vols.), 1778. His notes on Sophocles were bought by Oxford Univ. after his death, and were included in an ed. of the tragedies pub. at Oxford in 1800. See Schweighäuser's ed. of Apian; *Gentleman's Magazine*, 1770; J. Nichols, *Literary Anecdotes*, 1781.

**Musgrave, William** (c. 1657-1721), physician and antiquary, studied at Oxford. He was secretary to the Royal Society (1685), and settled in Exeter (1691), practising as a physician. He wrote treatises on gout and medicine. His 3 antiquarian studies, *Julii Vitalis Epitaphium*, 1711, *Geta Britannicus*, 1716, and *Belgium Britannicum*, were reissued as *Antiquitates Britanno-Belgicae*, 1719. For these researches he was presented by George I (some say his son, the Prince of Wales) with a diamond ring on 6 Aug. 1720. See A. & Wood, *Athenae Oxon.* iv (Bliss ed.), and W. Munk, *Coll. of Phys. i.* (2nd ed.), 1878.

**Mushroom**, name commonly given to the larger capped fungi, but chiefly to edible fruit bodies of the Agaricaceae, of which *Psalliota* (*Agaricus*) *campestris* is the common Field M., and *P. (Agaricus) hortensis* the cultivated M. of commerce, of which there are 2 distinct forms, a white and a brown. In appearance the cap is rounded when young, then convex, and finally flat, white, and smooth or brownish with darker scales; the stem is white with a torn volva girdling it; the gills are free, turning from white to pink, and then blackish brown on ageing. Field M.s appear in damp, warm weather, summer and autumn. Cultivated M.s are grown all the year round in prepared beds, which may be housed in dark sheds, cellars, caves, or buildings; requiring a temp. of about 60° F., reasonable humidity, and good ventilation, plus a good compost. Compost in the past has been preferably of stable manure from grain-fed healthy horses, carefully pre-rotted before use. In the face of increasing scarcity of stable manure, a synthetic compost of straw and chemicals has been evolved by the M. Research Association Ltd., Peterborough, England, and is in commercial use. Pure cultures have now replaced the old Brick spawn for inoculating M. beds. In Britain, most of the 40 million pounds produced commercially each year are grown in specially designed M. houses or glasshouses. See also **AGARICUS**; **CHANTERELLE**; **FUNGI**. See A. L. Kligman,

*Handbook of Mushroom Culture*, U.S.A., 1950; Ministry of Agriculture Bulletin 34: *Mushroom Growing*, 1950; F. C. Atkins, *Mushroom Growing To-day*, 1952; J. Rainsbottom, *Toadstools and Mushrooms*, 1954; *The Mushroom Grower's Bulletin*, monthly jour.

**Music**, although in its modern form the most artificial of the arts, is primarily the most universal and spontaneous. It differs from the other arts in that 'time', both in the rhythmic basis of M. and also in the definite duration of any musical phrase or performance, is an essential factor. In this it contrasts sharply with painting and architecture, which depend on spatial values, and it lacks the representational element in poetry, although poetry, M., and the dance probably had a common origin in ritual. They still share the vital element of rhythm. Physically M. is allied to mathematical science, the 2 fundamental concords, the octave and the perfect fifth, being built up from the frequency-ratios 2 : 1 and 3 : 2 respectively. These facts were known in the 6th cent. BC to Pythagoras, who also defined the tonal position of the fourth.

M. in some form is probably as ancient and universal as speech; but in the general acceptance of the term, Gk M. is the radix from which its European development must be traced. Gk M. was, doubtless, largely influenced by Chaldean and Egyptian, by Indian and Chinese, such as it was; and sev. early Christian chants were derived from Jewish synagogue tunes. But no deep study of such influences is possible, although it is surmised that ample material would have been available if the Alexandrian library had been preserved. Musical intonation was an important feature of all Gk drama, and even the Homeric epics were declaimed to the accompaniment of a lyre. The term M. was held by the Greeks to signify any art over which the 9 Muses presided, and poetry and melody were combined in one art form as a matter of course, although harmony in the modern sense was unknown—a characteristic which still persists in M. uninfluenced by the European tradition. The Gk system was based on the tetrachord, a group of 4 notes derived from the 4 strings of the early lyre; the total span was a fourth, but 3 *genera* were recognised, whereby the 2 inner notes could be diatonic or chromatic or enharmonic (i.e. including quarter-tones). With the development of the lyre the span was increased to 2 octaves by the superimposition of 4 tetrachords; hence were derived the modes, 8-note scales whose character depended on the position of the *mesē*, the upper note of the second tetrachord, which acted as a kind of tonic. Each mode was associated with a particular mood, and had a moral quality. Thus the Dorian mode was regarded as military and masterful, the Lydian as effeminate. At first all M. was handed down orally, as folk M. has continued to be, but with such importance attaching to M. as a literary adjunct, although its possibilities as an absolute art were

unsuspected, it was not long before some method of definite systematisation and notation of sound was sought. The Greeks developed 2 such systems, one for vocal and one for instrumental M., based on the letters of the alphabet, which could be differently placed so that half- and quarter-tones could be recorded. Under the Romans the chromatic and enharmonic *genera* and the tetrachord basis of the system fell into disuse, and the whole tradition might have been lost but for the Christian Church. In the early days the congregation took a musical part in the service, and the M. naturally took over many Gk and Jewish elements (cf. the verbal survival of *Kyrie Eleison* and *Alleluia*). Control gradually passed to the priesthood, who regularised it in the form of plainsong and estab. the eccles. modes. These are derived from the Gk modes, with important differences; the Gk names were differently applied to them by the theorist Boethius (d. c. AD 524). The Church frowned on instrumental M., which was probably allied to the dance as closely as vocal music was to words, and at first there was no rhythmic independence owing to the melody being tied to the scansion values of classical poetry. The commonest method of notation was the system of *neumae*, but this served only to remind the singer of the approximate difference in pitch of successive notes in a melody he had already memorised, without expressing the exact intervals. It was not until the early 10th cent. that any definite progress in notation was made, although the literal code, in which Lat. characters had superseded the Greek, had been developed, and the modern 7-letter method began to be used in conjunction with the *neumae*. About the time of Hucbald (d. 930), whose system of writing words in the spaces of a staff representing the strings of an instrument, useful in vocal M., did not survive him, a red line was drawn horizontally across a page to represent F; and the immediate addition of a green or yellow line above and parallel to the red, to give the locus of C, made possible the precise expression of any interval up to an octave. The present type of staff was reached in the 11th cent.; it consisted usually of 4 lines, although no number was definitely settled until the 16th cent., when a 4-line staff was restricted to plainsong, 5-line being used for other vocal M., and 6-line for organ and virginal. Signs F, C, and G were also written to their relative lines, thus originating the system of clefs. Bar lines were introduced about 1450 to indicate accent; their use for rhythmic definition did not become general till the 16th and 17th cents. Many of these improvements have been attributed to Guido d'Arezzo (d. c. 1050), but probably he did no more than systematise the general progress of the art. We owe to him the familiar symbols of solmisation (*ut, re, mi*, etc.), based on the opening syllables of each line of a hymn to St John the Baptist.

By this time, aided by the progress in notation, M. had reached the stage of the

'descant,' or 'discantus' (see HARMONY) from which the whole art of counterpoint was evolved, although the Gk practice of 'magadising' (i.e. singing in 2 parts, one an octave above the other) had been an attempt in the same direction. The *organum*, in which a series of fourths or fifths was added to a *canto fermo*, was the first step; its origins go back to the 9th cent. and may have been due to the difference of pitch in the voices. Further intervals, oblique and contrary motion, and a feeling for cadences were added by degrees, and the hexachord system was adopted as a scientific guide to teaching. This pointed towards the major scale, but such implications were regarded as *musica ficta* (the casual introduction of accidentals) and not followed to their conclusion. Composition at this time was an arbitrary process, governed by scientific rather than aesthetic rules; M. was classed with mathematics in the medieval univs. The 12th and 13th cents., sometimes called the Francoian period after the theorist Franco of Cologne, saw the development of the rhythmic modes, based on the old poetic metres, and further attempts to define consonance and dissonance. More than 2 independent parts were now allowed; the main voice was usually in the tenor, with the other parts embroidering above and below it. Among the new forms of vocal M. were the conductus, motet, rondel, and rota (or round), which introduced the principle of canonic imitation. The most famous example of a rota is *Sumer is iucmen in* (MS. c. 1240, Brit. Museum: see article in Grove's *Dictionary of Music*), a flowing 4-part canon over a brief 2-part refrain, also in canon. These early polyphonic problems gave rise to a considerable theoretical literature, chiefly written by monks.

Meanwhile secular M. had also changed: crude chants and folksongs had given place to the amatory and heroic songs of the minstrels (q.v.) of the 10th and 11th cents. During the 12th and 13th cents. the troubadours and trouvères in France, and the minnesinger and meistersinger in Germany, became prominent: many of them were of high rank, e.g. Count Wm of Poitiers (d. 1127) and Richard I of England (d. 1199). This movement was stimulated by contact with the E. through the Crusades, the spread of the chivalry ideal, and the growth of the vernacular languages. It was concerned with poetry as well as music, but had great musical influence owing to its rhythmic freshness and the strong folk element, which helped to loosen the old academic rules. The same period saw a great increase in instrumental M.; its notation was by means of tablatures based on the form of the instruments. The trouvère Adam de La Halle (d. c. 1287) wrote M. for a pastoral comedy and pointed the way to opera. The 14th cent. saw the introduction of a new method called *Ars nova*, in which the rhythmic modes were superseded, duple time was used as well as triple, and other new devices, such as faburden, were

added. The leading composer was Guillaume de Machaut (d. 1377).

The great polyphonic period began in the 15th cent. with the foundation of royal chapels, an enormous increase in technical resources, especially in imitative counterpoint, and the rise of national schools. In England Dunstable (d. 1453) achieved much greater smoothness of texture. The great Netherlands school, headed by Binchois (d. 1460), Dufay (d. 1474), and Okeghem (d. c. 1495), reached its height in Josquin des Prés (d. 1521). Later Netherlands composers founded schools in other countries, e.g. Willaert (d. 1562) and Cyprien de Rore (d. 1565) in Venice and Arcadelt (d. c. 1567) in Rome, where the tradition of polyphonic church M. reached its apex in the work of Palestrina (d. 1594) and the Spaniard Victoria (d. 1611). The greatest of the later Flemings, Lassus (d. 1594), was a prolific composer in all styles, sacred and secular. This period was marked by the gradual decline of the modal system and a much greater interest in the emotional use of harmony as against polyphonic devices for their own sake. A stimulus was also given to Ger. church M. by the Lutheran Reformation, which encouraged congregational singing and popularised the chorale. Eng. church composers of the period were Tye (d. 1573), Tallis (d. 1585), Byrd (d. 1623), and Gibbons (d. 1625). Meanwhile secular music, aided by the Renaissance, and the discovery of printing, flowered rapidly in the Fr. *chanson* and the It. madrigal, which was a cross between the popular *frottola* or street song and the Flem. motet. Marenzio (d. 1599), Gesualdo (d. 1614), and Monteverdi (1567-1643) introduced new freedom and expressiveness into the madrigal, which was perfected in England in the works of Byrd, Gibbons, Morley (d. 1603), Weelkes (d. 1623), Wilbye (d. 1633), and Tomkins (d. 1656). The first to write important original M. for the organ (introduced from the E. in the 8th cent., but for long very primitive) was the Venetian Andrea Gabrieli (d. 1586), who developed the *ricercare* and *occiata*. He was followed by Merulo (d. 1604), Sweelinck (d. 1621), and Frescobaldi (d. 1643), in whom the fugue approached mature form. Much early instrumental M. was simply transcribed from the motet, but dances were written for the lute and the popularity of the new domestic keyboard instruments gave rise to a true instrumental style, especially in England and Italy. It found expression in suites, variations, and primitive programme M. Fantasies for groups of viols were the ancestors of chamber M. An early master of orchestral M. was Giovanni Gabrieli (d. 1612), Andrea's nephew, who wrote antiphonal works for contrasted groups of instruments.

The next new forms, both originating in Italy about 1600, were opera and oratorio. Opera was an attempt to revive the Gk combination of M. and drama, and was also influenced by the madrigal; its first exponents were the Florentines Peri (d. 1633) and Caccini (d. 1618), but Monteverdi

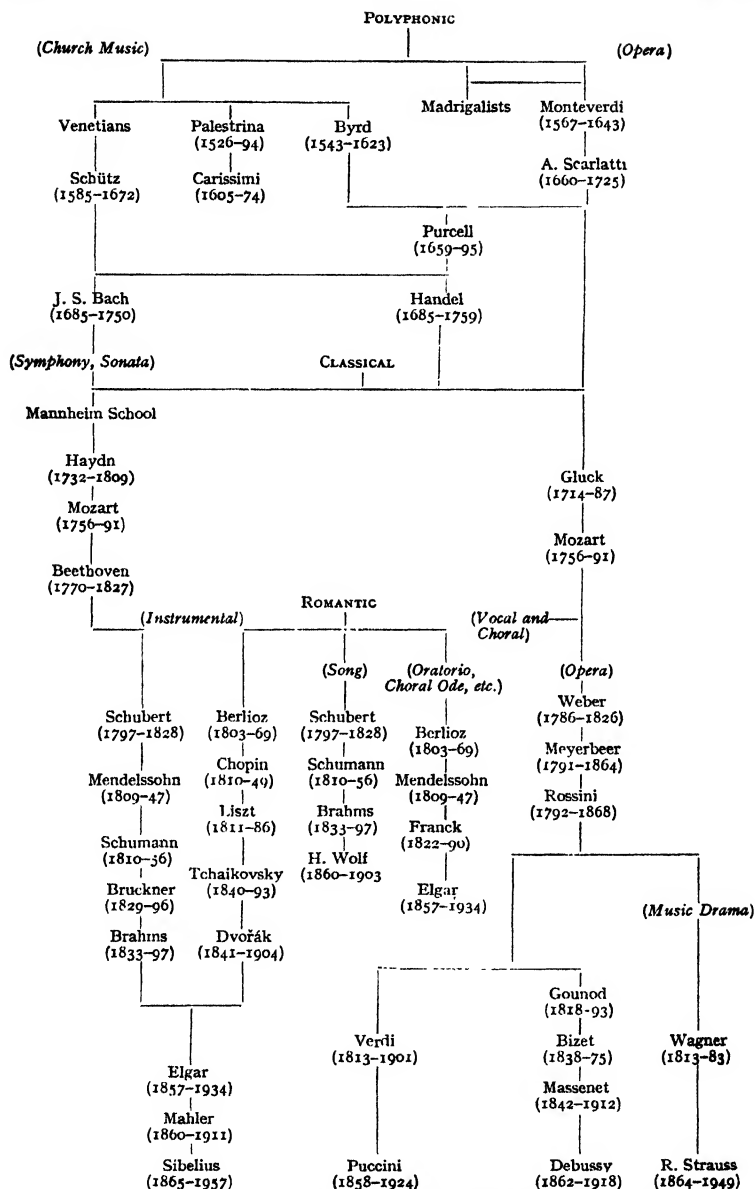


DIAGRAM SHOWING THE CHIEF LINES OF DEVELOPMENT OF MUSIC TO THE EARLY TWENTIETH CENTURY AND THE RELATIVE POSITIONS OF THE PRINCIPAL COMPOSERS

was the first master (*see* OPERA). His influence on the hist. of M. was enormous. He introduced string tremolando and pizzicato, and his harmonic advances led to the final substitution of key for the modal system. The first opera house was opened at Venice in 1637, and a thriving tradition began. Oratorio, in part evolved from the incidental M. of the early miracle and morality plays, began in Rome with Cavaleri (*d.* 1602). At first it was staged like opera, but Carissimi (*d.* 1674) endeavoured to separate it by strengthening the choral element. In Germany Schütz (*d.* 1672) produced a new type by combining Venetian influence with old Ger. Passion M., while a flourishing school of keyboard composers arose in Froberger (*d.* 1667), Buxtehude (*d.* 1707), Reinken (*d.* 1722), and Pachelbel (*d.* 1706) for the organ, and Kuhnau (*d.* 1722) for the harpsichord. All these traditions were consummated in the work of J. S. Bach. Italy still led the field in other instrumental forms, especially for strings, thanks to the perfection of the violin by the craftsmen of N. Italy. The trio-sonata, and concerto were developed by Corelli (*d.* 1713) and Vivaldi (*d.* 1741), and the harpsichord sonata by Domenico Scarlatti (*d.* 1757). Meanwhile It. opera had overrun Europe, but only in France, where Lully (*d.* 1687) combined it with the ballet, was a national style founded. In England Purcell (*d.* 1695) showed high dramatic genius but estab. no tradition. It. opera was standardised by Alessandro Scarlatti (*d.* 1725), after whom it became too obedient, up to the time of Rossini at least, to the demands of singers, except in the hands of foreigners like Handel, Gluck, and Mozart (*see* OPERA).

The first half of the 18th cent. is dominated by the figures of Handel (1685-1759) and J. S. Bach (1685-1750). Handel's style was compounded of It. and Eng. elements, and his genius essentially dramatic, as shown in his Jewish oratorios even more than his 40 It. operas, although he used all the known forms. He combined unsurpassed lyric sweetness with massive choral effects on a greater scale than ever before. Bach's genius was religious and contemplative, introvert rather than extrovert; his Passions, church cantatas, and organ works are the summit of their kind. He was also the composer of much excellent violin and clavier M., and carried the new tonal polyphony to its utmost limits. Thanks largely to him a whole new world of keyboard M. was opened up by the general acceptance of 'equal temperament' (*see* TEMPERAMENT), which rendered possible the use of extreme sharp and flat keys and a greatly extended variety of modulations. But his full influence was delayed, since his greatest M. remained unknown for nearly a cent. In France his most important contemporaries were François Couperin (*d.* 1733) in keyboard M. and Rameau (*d.* 1764) in grand opera and ballet. It was in France too that Gluck (1714-87) completed his memorable reform of opera, designed to end the tyranny of singers, emphasise dramatic expression, and so

return to something like the principles of Monteverdi. The middle years of the cent. saw the rise of an important movement led by Johann Stamitz (*d.* 1757) at Mannheim, where the modern orchestra and the symphony were developed from beginnings in Italy, and sonata form, based on key contrast and a reaction from polyphony, began to come into its own. It was derived partly from the binary form of the old dance movements and partly from the operatic aria of Scarlatti and Handel. C. P. E. Bach (*d.* 1788) advanced the modern piano sonata by applying sonata form to the colour possibilities of the new instrument. Symphony, sonata, and string quartet were all perfected by Haydn (1732-1809), the first of the great Viennese classical composers, and further extended by Mozart (1756-1791), whose use of chromaticism introduced an almost romantic expressiveness, but who was also a master of counterpoint. He was the one composer to reach the highest rank in every musical form; his operas, remarkable for their subtle characterisation, both summed up the whole It. tradition and led by way of Ger. *Singspiel* to romantic opera. Judging by his experiments in harmony and 'colour,' and by the perfection to which he developed the new forms (including the concerto, which he made particularly his own), it has been suggested that, but for his premature death, he would have done much that Beethoven (1770-1827) was left to accomplish. But however much Beethoven's earliest M. may resemble Mozart's latest, his second and third period works, his sonatas, concertos, and chamber M., no less than his wonderful symphonies and overtures, opened up vast new ters. in the realm of individual and subjective expression. His last works, long misunderstood, looked far into the future.

If Beethoven is the point of transition from 'classical' to 'romantic' (the terms are unsatisfactory, but have a generally accepted significance) in instrumental M., the same must be said of Schubert (1797-1828) in song, and of C. M. von Weber (1786-1826) in opera. The Romantic Movement (q.v.) of the early 19th cent. was a general artistic reaction against 'academism' and formalistic narrowness; it appealed to the remote, violent, and mysterious, became connected with political and social ideals, and ended as a cult of the excessive. Romantic M. soon developed a strong literary content, and sought to express alien ideas of all kinds, often at the expense of formal balance. Beethoven influenced the whole of 19th-cent. M., but in many different ways. The classical tradition of sonata and symphony was followed (with deviations) by Mendelssohn (1809-47) and Brahms (1833-97). The leaders in piano M. were Chopin (1810-47) and Schumann (1810-56), whose attempts at the larger forms were less successful. The mantle of song passed from Schubert to Schumann, Brahms, and Wolf (1860-1903). The first great exponent of programme M. was Berlioz (1803-69), whose remarkably original

powers of melody, drama, and orchestration were not at first recognised. Liszt (1811-86), besides exploiting the virtuoso powers of the piano and making important harmonic innovations, evolved from the symphonic form of Beethoven, the colour of Berlioz, and certain elements in Schubert's instrumental works a new form, the 'symphonic poem,' in which he practised an elaborate method of theme transformation. This form has been cultivated by many later composers, most successfully by Richard Strauss (1864-1949). The central figures of the period in opera were Wagner (1813-83) and Verdi (1813-1901). Wagner, beginning as a composer of grand opera in the Meyerbeer manner, combined Beethoven's method of symphonic development, Liszt's theme transformation, and certain of Gluck's ideals in a vast new stage form, the M. drama, which he described and justified in numerous prose writings. It is peculiar to Wagner and has defied would-be successors, although the operas of Strauss approach it at some points. It is closer to the symphonic poem than to true opera, which it did not supersede. Indeed opera flourished throughout the cent., particularly in Italy and France, where the spectacular methods of Meyerbeer (1791-1864) were succeeded by the more lyrical style of Gounod (1818-93), Massenet (1842-1912), and others, and the revitalised *opéra-comique* of Bizet (1838-75). In Italy the traditional line led through Rossini (1792-1868), Donizetti (1797-1848), and Bellini (1801-1835) to Verdi, in whom it reached the height of musical and dramatic expressiveness. It then declined into crudity and shallowness in the hands of too many composers, but Puccini (1858-1924) showed a strong lyrical and dramatic gift.

Related to the Romantic Movement are the nationalist movements, which drew much of their strength from folksong. In Russia the movement began with Glinka (1803-57) and reached great distinction in the instrumental works of Balakirev (1837-1910) and Borodin (1833-87) and the operas of Mussorgsky (1839-1881) and Rimsky-Korsakov (1844-1908). Tchaikovsky (1840-93), who used all forms, was more influenced by the W. romantic tradition; his symphonies have a strong subjective element. In Scandinavia Grieg (1843-1907) showed a genius for the song and short piano piece, and Sibelius (1865-1957) for the symphony. In Bohemia Smetana (1824-84) founded a national opera, later enriched by Janáček (1854-1928), and Dvořák (1841-1904) enriched the classical forms. Later a lively Sp. school grew up under Albéniz (1860-1909), Granados (1867-1916), and Falla (1876-1946). The end of the cent. saw Austria upholding the symphonic tradition, with more dignity in Bruckner (1824-96) than in Mahler (1860-1911), and the rise of important new movements in France and England. Franck (1822-1890) late in life popularised cyclic form by applying Liszt's methods to the sonata, and the far-ranging harmonic experiments of Debussy (1862-1918) bore

fruit in 'impressionism.' Ravel (1875-1937) developed on similar lines with a personal harmonic idiom, and the exuberance of Chabrier (1841-94) and the harmonic subtlety of Fauré (1845-1924) also left their mark. In England Elgar (1857-1934) added a personal and national flavour to the classical tradition in large-scale choral and instrumental works, and Delius (1862-1934) adopted an intensely individual harmonic style. Holst (1874-1934) and Vaughan Williams (b. 1872) returned to folk M. and built up a style capable of mastering both traditional and modern forms on the largest scale.

The 20th cent. has seen a development in M. of revolutionary rapidity to which there have been 2 main contributing factors; first the break-up of the key system, largely due to the influence of Wagner and Debussy, and the search for freer forms, new rhythmic patterns, 'atonality' (the abolition of 'key'), polytonality, and harmonic systems built on the whole-tone, 12-note, and many other more intricate scales; secondly the rapid perfection of mechanised M., notably wireless, gramophone, and cinematograph reproduction. Two of the biggest influences in modern M. are Stravinsky (b. 1882), who has formed no definite 'style,' but has experimented in many new and daring rhythmic forms and 'tone-colours,' and Schoenberg (1874-1951), whose 12-note system, first adopted by Webern (1883-1945) and Berg (1885-1935), has formed a large school in many countries. Other important modern composers, apart from those mentioned above, are Hindemith (b. 1895) in Germany; Bartók (1881-1945) and Kodály (b. 1882) in Hungary; Ionescu (1892-1955) and Milhaud (b. 1892) in France; Pizzetti (b. 1880) and Malipiero (b. 1882) in Italy; and in England and America Bax (1883-1953), Ireland (b. 1879), Bloch (b. 1880), Bliss (b. 1891), Copland (b. 1900), Rubbra (b. 1901), Walton (b. 1902), Berkeley (b. 1903), Barber (b. 1910), and Britten (b. 1913). In the period after the First World War the reaction against the excesses of romanticism took an extreme form, resulting (as in the other arts) in various forms of self-consciousness and exhibitionism, whereas after the Second World War new tendencies have been taken up with an earnestness which suggests that too many composers are taking themselves only too seriously. But it is too early as yet to assess them. An important present-day factor, the mechanisation of M., has brought knowledge and appreciation of M., especially classical M., to a vast hitherto uninterested public, and splendid performances of all important works can be heard through the media of wireless and the gramophone. The standard of criticism, and thus of performance, is rising, and the demand for new M., for instance in the cinema, can hardly fail to encourage the composer. Jazz (q.v.) M. is a conspicuous contemporary phenomenon throughout the U.S.A. and Europe, as a dance-form and for mechanical transmission. Primarily it is an exploitation of syncopated

rhythm, usually at the expense of other musical qualities, and it owes much to primitive Negro M. It is largely ephemeral, but may leave its mark on a few surviving works. A more significant phase of the popularisation of M. is the revival both in Europe and America of musical festivals and societies and the high standard of performance that distinguishes their concerts. *See also* articles on BRITISH, FRENCH, GERMAN, ITALIAN, and RUSSIAN MUSIC; HARMONY; OPERA; ROMANTIC MOVEMENT; SONG; SYMPHONY; etc.; and on the various composers.

*See Oxford History of Music: H. Foss (ed.), The Heritage of Music, 1927; W. J. Turner, Music: a Short History, 1932, 1949; P. H. Lang, Music in Western Civilisation, 1941; T. M. Finney, A History of Music, 1948; Grove's Dictionary of Music and Musicians (5th ed.), 1954; E. Blom, Everyman's Dictionary of Music (revised ed.), 1954; C. Humphries and W. C. Smith, Music Publishing in the British Isles from the Earliest Times to the Middle of the Nineteenth Century, 1954; G. Reese, Music in the Renaissance, 1954; New Oxford History of Music (11 vols.) (in the press); Oxford Companion to Music (9th ed.), 1955; O. Thompson (ed.), The International Cyclopaedia of Music and Musicians (revised ed.), 1956; H. Hartog, European Music in the 20th Century, 1957; P. Garvie (ed.), Music and Western Man, 1958; Man and his Music (4 vols.), 1957-8.*

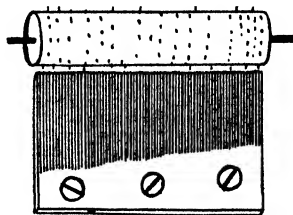
**Music, Royal College of, see ROYAL COLLEGE OF MUSIC.**

**Music, Schools of, see SCHOOLS OF MUSIC.**

**Music and Dancing Licences.** Within the Metropolitan Police dist. (i.e. within 20 m. of the cities of London and Westminster, or in Middx) every house, room, garden, or other place used for public music or dancing must be licensed for that purpose by the co. council or co. bor. council within whose jurisdiction the place is situated. Elsewhere licences are required only in those towns where section 51 of the Public Health Act, 1890, has been adopted, in which cases the licences are granted by the magistrates. The mere occasional use of a room for music and dancing, or a temporary use for dancing on the occasion of a festival, does not, but a skating rink where music is played does, require a licence. The decided cases show that to require a licence there must be something habitual about the use of the place for public music or dancing, though using the place once a month only would probably be regarded as 'habitual'. The licensing authority have an absolute discretion to grant or refuse a licence, subject to the obligation to exercise the discretion in a judicial manner.

**Music Halls.** The 'music hall,' or 'variety theatre,' is a development of the 'saloon theatres,' which existed in London in 1830-40. These were attached to taverns, and were very popular among the middle and lower classes who liked to mix their dramatic amusements with smoking and light refreshments. They gave dramatic performances as well as

variety entertainments, but were restricted by the 'patent rights,' which were ultimately abolished through the efforts of a number of distinguished literary men, among whom were Charles Dickens, Sir Edward Bulwer-Lytton, and Sir Thomas Noon Talfourd. After this the saloons gradually improved in character, and the M. H. of to-day began to appear, the first being the Canterbury in Lambeth, which, under the direction of Charles Morton, cultivated the best class music; indeed 'An Operatic Selection' of Gounod's *Faust* was first performed in England here. Morton also opened the Oxford, and other halls soon followed, their popularity being assured by the cheap prices and physical comforts which they afforded. But the advance in the M. H. excited the jealousy of the theatre, and matters came to a crisis in 1865 when an ambitious ballet was produced at the Alhambra in Leicester Square. The Alhambra was prosecuted for infringing the Stage-play Act, and a long, unsatisfactory trial followed, with the result that the matter was taken up by Parliament, and the M. H. were granted the privilege of producing ballets, vaudevilles, pantomimes, and other light pieces. Some of the chief in the list of M. H. are the Coliseum, the London Hippodrome, the Pavilion, and the Palladium, and associated with them and older halls are the names of George Leybourne, Bessie Bellmore, Harry Champion, the Great Vance, Charles Coburn, Chirgwin the White-eyed Kaffir, Gus Elen, and Marie Lloyd. The advent of the cinema, and especially the development of sound films, seriously affected the prosperity of M. H., and many were converted into cinema houses, the Empire and the Tivoli in London being notable examples. At the present time the term 'music hall' is giving place to the more applicable name of 'variety theatre,' the programme of entertainment often taking the form of 'revue.' *See* A. Hadden, *The Story of the Music Hall*, 1935; M. W. Disher, *Winkles and Champagne*, 1938; H. Scott, *The Early Doors*, 1947; C. D. Pulling, *They Were Singing*, 1952.



MUSICAL BOX

**Musical Box,** instrument for producing music by mechanical means, little more than a toy with no great artistic scope or value. It was invented in the middle of the 18th cent. by the Swiss, who fitted minute plugs on a metal cylinder so arranged that they would strike separate



bars of steel and set them vibrating, and so produce different tones.

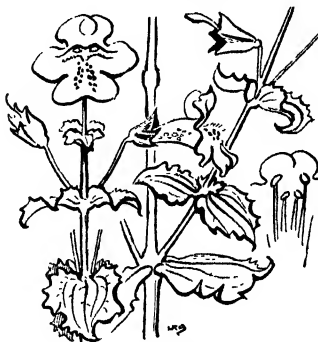
**Musical Comedy**, form of theatrical entertainment, developed from *opéra-bouffe*. It usually consists of a slight story interspersed at appropriate points by songs and dances. Musical plays of this type first found their outstanding popularity with the London productions of George Edwards (1852-1915) at Daly's Theatre and the Gaiety. Notable M. C.s include *The Shop Girl* (Ivan Caryll), which was produced in 1894 and ran for 2 years, *The Geisha*, *A Country Girl* (both by Lionel Monckton), *San Toy* (Sidney Jones), *The Belle of New York* (Gustav Kerker), *The Maid of the Mountains* (Harold Fraser-Simson), *Floradora* (Leslie Stuart), *Chu Chin Chow* (Frederic Norton), which had the second longest run in the hist. of the Brit. theatre, *The Chocolate Soldier* (Oscar Straus), and *The Merry Widow* (Franz Lehár). Outstanding names of the 1920's were Rudolf Friml (*Rose Marie* and *The Vagabond King*), Sigmund Romberg (*New Moon*, *The Student Prince*, and *The Desert Song*), Vincent Youmans (*Not a Not Nancette*), Jerome Kern (*Sally*, *Sunny*, *Show Boat*, and *Robert*), and George Gershwin (*Lady, be Good*), all American; and Noel Coward (*Bitter Sweet*). The thirties saw *White Horse Inn* (Robert Stolz), the musicals of Ivor Novello (*Glamorous Night*, *Careless Rapture*, and *The Dancing Years*), and in America the rise of Cole Porter (*The Gay Divorcee*, *Anything Goes*, and, more recently, *Kiss Me Kate*). Outstanding names in the presentation of M. C. include C. B. Cochran (1872-1951) in London, and Florenz Ziegfeld (1867-1932) and Earl Carroll (1893-1948) in New York. After the Second World War a new school of Amer. musicals brought a freshness and vitality to M. C. Among its features were revolutionary, inventive choreography and more realistic characterisation. The first musical of this type was Rodgers' and Hammerstein's *Oklahoma!*. Subsequent productions included *Carousel*, *South Pacific*, *The King and I* (all by Rodgers and Hammerstein), *Annie Get your Gun* (Irving Berlin), and *Gypsy* and *Dolls* (Frank Loesser). The enormously successful Amer. M. C. *My Fair Lady* (Frederick Loewe) was based on G. B. Shaw's *Pygmalion*. Brit. musicals of this period have generally aimed at a more ingenuous appeal (e.g. Julian Slade's *Salad Days* and *Free as Air*); *The Boy Friend* (Sandy Wilson) was a gentle satire on the M. C.s of the 1920's.

**Musical Glasses**, see ARMONICA.

**Musk** (*Mimulus moschatus*), small perennial plant of the family Scrophulariaceae, with hairy leaves and bright yellow flowers. Some fine horticult. varieties have been introduced. These are best grown in pots trained on wire frames or in hanging baskets.

**Musk, Artificial**, substances known chemically as trinitro-dimethyl-tertiary-butylbenzene (*Musk Xylol*), dinitro-methyl-tertiary-butyl-anisole (*M. Ambrette*), tertiary-butyl-dinitro-dimethyl-acetophenone (*M. Ketone*), dinitro-

tertiary-butyl-isopropyl-toluene (*Moskene*), Heptamethyl-Indene-Ketone (*Phantolid*). They are used in perfumery as cheap substitutes for natural M., which they closely resemble in odour. They have remarkable fixing and blending properties. Synthetic reproductions of the odorous principle of natural M. are *Eraltolide* (pentadecanolid) and *Ambretolide* (lactone of hydroxy-hexadecenoic acid), possessing a strong and persistent M. odour. When used in traces as 'exalting' agents both render excellent services in finest perfumes and ambergris colognes. See also PERFUMERY.



MUSK

**Musk Deer** (*Moschus moschiferus*), native of the mountainous parts of central Asia, which yields the musk of commerce. It is a small animal about the size of a roe-deer, 20 in. in height, with large ears, long legs, and coarse, goat-like hair, which varies from a pale grey to a dark brown, spotted with tints of a lighter colour. It is of special interest to zoologists in that it possesses certain intermediate characters between the antelopes and the deer, and it is now placed in a special subfamily, Moschinae, of the order Cervidae (q.v.). It is unique among deer in possessing a gall bladder, which is found in most of the antelopes. Antlers and horns are absent in both sexes, but, like the muntjac, the male has the upper canine teeth developed into projecting tusks 3 in. or more long. It is a solitary animal, feeding on leaves and flowers of forest shrubs. It is abnormally hardy and sure-footed on the most dangerous ground, being much assisted by the specialised development of the hoofs. Musk occurs as an unctuous secretion in a gland beneath the skin of the abdomen of the adult male, the animals being captured and mercilessly killed by hunters. The freshly removed gland has a prevailing odour of uncured hide and the characteristic powerful and most tenacious musk odour develops on drying. The dried glands are known as 'pods' from which the dried secretion of reddish-brown to black colour is carefully removed and as 'musk grains' is one of

the most indispensable raw materials used in luxury perfumes in form of alcoholic tincture, traces of which fortify and fix the basic odour, giving it a wonderfully diffusive and subtle 'animal note.' The finest quality of musk pods in commerce is known as 'Tonquin Musk' coming from Tibet and the high mts of the adjoining Chinese provs. The odorous product in musk (1 to 2 per cent) is known as Muscone; it was first isolated in 1906 by Walbaum and identified in 1926 by Ruzicka as being 3-methyl-cyclopentadecanone.

**Musk Ox, or Musk Sheep** (*Ovibos moschatus*), animal which, as the generic name implies, has features in common with the sheep and the ox. It is about the size of domestic cattle, and is covered with a dense coat of very long brown hair. The horns of the bulls meet in the middle line of the forehead. The legs are short, but the feet have a large spread, with a footprint much like a reindeer's, and the animals are capable of some speed. They are social in habit, and are now confined to N.E. Canada, Greenland, and some of the neighbouring is., though, at a remote period, they have had a very extensive range, which included Britain. At some seasons of the year they exhale a strong odour of musk, and this pervades the flesh, although it is well flavoured.

**Musk Plants.** The odour of musk occurs in a number of plants, besides the common musk. The musk mallow (*Malva moschata*) emits the odour when rubbed, especially in hot weather. The musk stork's bill (*Erodium moschatum*) smells strongly of it if handled; but the moschatel (*Adoxa moschatellina*) diffuses it from all parts of the plant except when bruised. The musk thistle (*Cardinus nutans*) has a powerful musky scent. The musk orchis (*Hermidium monorchis*) smells like musk at night. A melon (*Cucurbita moschata*), the musk rose, and the musk-wood (*Olearia argophylla*) are among many other plants, etc., which give rise to the odour.

**Musk Rat**, name given to a number of rodents, and also to one insectivore, which diffuse a musky odour. It most commonly indicates the musquash (*Fiber zibethicus*). Allied to the voles and beavers, the musquash is found in Alaska and Canada. It is specialised for an aquatic life, the toes being webbed, and the long, almost naked tail being scaly and flattened laterally. The head and body together measure about 12 in. Though inclined to be omnivorous, it is chiefly vegetarian, and stores up food for the winter by plastering it with mud into curious structures like haycocks. The musk is secreted by both sexes in a large gland in the groin.

**Musk Sheep**, see MUSK OX.

**Muskegon**, city, co. seat of M. co., Michigan, U.S.A., on Lake Michigan at mouth of M. Riv., in resort area 35 m. N.W. of Grand Rapids. It has oil wells and refineries and manufs. paper and leather products, aeroplane, automobile, and marine engines, billiard and pool tables, and tools. Pop. 48,400.

**Muskegon Heights**, city in M. co., SW. Michigan, U.S.A. It manufs. machinery. Pop. 18,825.

**Musket**, see FIREARMS.

**Musketry**, military term applied to that branch of work which deals with the theory and practice and regulations concerning small arms, the rifle, carbine, and revolver, and machine-guns (see FIREARMS). The training in the use of weapons is graded from recruit drill, through various range and field practices, to special competitions. The marksman badge, crossed rifles, is awarded for highest efficiency, the 'best shot' having a star in addition. Field practice is very varied, being the development of range practice towards the requirements of M. in actual warfare; it includes company, battalion, and squadron practice, and deals with the tactical use of small arms.

**Musketry, School of**, see SMALL ARMS SCHOOL.

**Muskogean Language**, div. of Amer. Indian languages, including Alibamu, Chickasaw, Choctaw, Creek, Natchez, and Seminole. See NORTH AMERICAN NATIVE LANGUAGES.

**Muskogee**, city and the co. seat of M. co., Oklahoma, U.S.A., 45 m. SE. of Tulsa. It is the centre of an agric. and stock-raising region, and yields natural gas and oil. Its manufs. include road machinery, oil-well equipment, feed, glass, iron, bricks, leather, canvas goods, clothing, furniture, brooms, mattresses, and truck, wagon, and trailer bodies. Pop. 37,289.

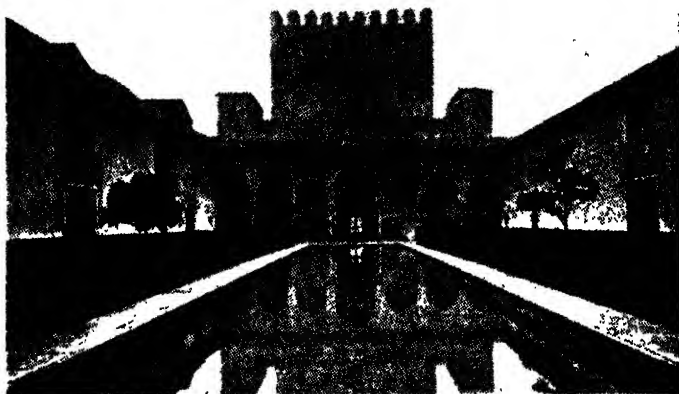
**Muskoka**, dist., riv., and lake of Ontario, Canada, on the E. of Georgian Bay. The first named has numerous lakes interlaced by streams, and is a popular resort for holiday-makers, summer cottagers, and anglers. Bracebridge is the cap. The riv. rises in the Nipissing dist. of Ontario, and flows in a south-westerly direction, through the lake, into Georgian Bay. The lake is situated in the middle of the dist. and communicates in the N. with Lake Rosseau.

**Muslim Architecture and Art** (otherwise known as Arab, Arabian, Islamic, Mahometan, Mohammedan, Moslem, Muhamadan, or Saracenic Art). 'Muslim,' an Arabic word, is the term now usually adopted by scholars to describe the architecture produced by the Arab followers of the religion of Islam—i.e. Muslims—in many parts of the E. hemisphere after the prophet Mohammad estab. Islam in Arabia in the year AD 622, which is the first year of the Muslim calendar. This brief statement explains all the alternative names mentioned above, except 'Saracenic' which is really a nickname, like 'Whig' or 'Tory' or 'Quaker,' and was introduced into English during the Middle Ages to describe the wild Arab warriors—'Saracens'—encountered by the Crusaders. 'Saracenic' was also applied by Wren (q.v.) to Gothic architecture; and modern scholarship recognises that his use of the term in that connection was not so absurd as it seemed to critics of a cent. ago, for many features of Gothic architecture (q.v.) are now

attributed to the contacts made by the Crusaders with 'Saracenic' architecture, though the term is now discarded. Muslim architecture has therefore some significance in the hist. of European Gothic, but is even more important because it has been practised for 13 cents. by a large part of the human race as far N. as Turkestan and Yugoslavia, as far W. as Spain and Morocco, as far E. as China and Indonesia, as far S. as Zanzibar and Nigeria. There is a mosque for Malayan Muslims in Cape Town, and one for Eng. Muslims at Woking.

When the Arab armies, composed of uneduc. and uncultured soldiers, swept westwards from Arabia to Spain and even into central France within a cent. from

building which had continued uninterrupted in Cairo since the 9th cent. (ii) *Turkish*, in which the great Byzantine church of S. Sophia at Constantinople influenced the design of all the large mosques subsequently built there. (iii) *North African* or 'Moorish,' comprising the modern countries of Tunis, Algeria, Morocco, and most of Spain (see SPANISH ARCHITECTURE). (iv) *Persian*, including modern Iraq, where the earlier brick-vaulted buildings of the Sassanids influenced mosque construction. (v) *Indian* (see INDIAN ARCHITECTURE). India was invaded from Persia by the Muslims in 1193, when the city of Delhi was founded. Some of the earlier mosques closely resemble Persian examples; but



THE COURT OF THE MYRTLES, THE ALHAMBRA, GRANADA

the foundation of Islam, and eastwards as far as the frontiers of India and China, they had no domestic architecture of their own, for they were nomads, and their only dwellings were black camel-hair tents such as the modern Bedouin still use. Their first mosques (see MOSQUE) were rude enclosures for prayer. In each country that they captured, they utilised the services of local architects and craftsmen to build their mosques and—as they became settled and prosperous—their palaces and tombs. Thus distinctive regional schools of M. A. and A. grew up, each influenced by the local tradition. Existing buildings were often despoiled to provide material for mosques, and occasionally old buildings were incorporated in their structure. The following are the 5 chief regions: (i) *Syro-Egyptian*, including Syria and Egypt. The finest mosques, etc., all in stone, are to be seen in Cairo. Many Rom. columns and capitals were used in the earliest mosques there. At Jerusalem the famous 'Dome of the Rock' shows Byzantine influence. In 1517 the Turks conquered Egypt and interrupted the magnificent sequence of

as Hindu craftsmen were employed, a curious medley of design resulted, culminating in the splendid mosques, tombs, and palaces built by the Mogul emperors during the 16th-17th cents., and constituting the 'Mogul' or 'Mughal' style. The mosque plan, with certain variations, was common to all the 5 regions, with its distinctive minarets. Domes were largely used, and the horse-shoe arch (see ARCH) became a distinctive feature everywhere. Ornamental lattices of stone, marble, wood, and stucco were also used in window openings in all these countries, where the glare of the sun discouraged the use of ordinary glazed windows. Marble inlay and paving were also freely employed; and in Persia, where bare brick walls were considered unsightly, the ancient craft of glazed tiling was revived, and spread into Syria and India.

All Muslim art is conventional in design, as the Muslim religion forbade the representation of animal or plant life or human portraiture. Some Muslim artists, however, broke away from this tradition, for leaves and flowers are to be

found in Persian designs. In miniature painting also and in illuminated MSS. plant, animal, and human forms appear, but never with the same freedom as, for instance, in Chinese paintings. The portrait in Muslim art is also conventionalised. Persian paintings are most notable for their combination of line and colour, while in the paintings of India it was as colourists that the Muslim artists most excelled. The flower design in Muslim ceramics derives from the early Persian period; the colours, design, and glaze of this pottery are extremely harmonious. Examples of Muslim art as applied to weapons and armour are found especially in Turkey and Persia. The Turkish helmets were cone-shaped and beautifully engraved with arabesque designs with gold and silver decorations. Owing to the religious restrictions laid upon the arts, calligraphy was always a great source of design.

See H. Saladin and G. Migeon, *Manuel d'Art Musulmane*, 1907; P. Brown, *Indian Painting under the Moguls*, 1924; M. S. Briggs, *Muhammadian Architecture in Egypt and Palestine*, 1924; E. Diez and H. Gluck, *Die Kunst des Islams*, 1925; T. W. Arnold, *Painting in Islam*, 1928; M. S. Dimand, *Handbook of Mohammedan Decorative Art*, 1930; V. Smith, *History of Fine Art in India and Ceylon*, 1930; K. A. C. Creswell, *Early Islamic Architecture*, 1932, *A Short Account of Early Muslim Architecture*, 1958; M. S. Briggs, chapters on Muslim architecture in T. W. Arnold, *The Legacy of Islam*, 1931, and in G. Garratt, *The Legacy of India*, 1937.

**Muslin**, fine cotton cloth, said to have been first made at Mosul (q.v.), a city of Mesopotamia. It resembles gauze in appearance, except that it is woven plain without any twisting of the warp threads on the weft. Some very fine specimens have been produced in India, the Arni M. of the Madras prov. and the Dacca M., made at Dacca, in Bengal, being especially famous. The material is now made in Europe and numerous varieties are produced. It is used for dresses, curtains, blinds, cushion-covers, etc.

**Musorgski, M. P.**, see **MUSSORGSKY**.

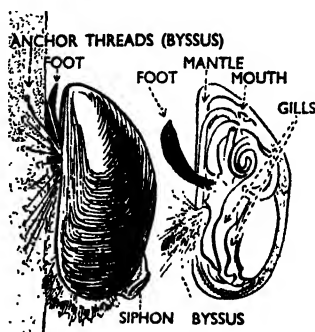
**Muspratt, James** (1793-1856), Irish manufacturing chemist, and the founder of the Brit. alkali industry, b. Dublin. After service in the Peninsular war, and in the navy, he began the manuf. of chemical products for commercial purposes. Starting in Ireland with the production of potassium ferrocyanide, he moved to Liverpool, setting up a plant to produce sulphuric acid, and later sodium carbonate. Hydrochloric acid was recovered from the fumes by a process evolved by Wm Gossage. It was the beginning of the Brit. heavy chemical industry. His son, James Sheridan M. (1821-71), was also a distinguished chemist.

**Musquash**, see **MUSK RAT**.

**Mussavat**, Muslim democratic party in Russian Azerbaijan (see **AZERBAIJAN**), formed 1911-12 in Baku by a group of young intellectuals, many of whom had been closely associated with the local

Bolshevik organisation during the revolution of 1905 (q.v.). It was at first pan-Islamic and advanced no specific demands for the Azerbaijani people. As a pro-Turkish party M. had to suspend open political activity during the First World War. After the Feb. revolution (q.v.) in 1917 it was the dominant party among the Muslims in Transcaucasia (q.v.) and later in the Azerbaijani Rep.

**Mussel**, name for various forms of mollusc, but most commonly applied to the numerous widely distributed Mytilidae. The common M. (*Mytilus edulis*), which forms the familiar wedge-shaped shell, is very abundant in Brit. estuaries. While young the M.s are capable of moving



about with the aid of the small brown foot, but later they attach themselves to rocks and to one another by spinning a bundle of tough threads (*byssus*). Though they are even more liable than oysters to pollution, they are important articles of diet in many dists., but they are utilised in greater numbers as bait in deep-sea fisheries. The fresh-water M.s (Unionidae) are also numerous and widely distributed. The pearl M. occurs chiefly in Scottish rivers.

**Mussel-picker**, see **OYSTER-CATCHER**.

**Musselburgh**, tn and parl. burgh of Midlothian, Scotland, on the Firth of Forth, at the mouth of the Esk, 5 m. E. of Edinburgh, of which it has become practically a suburb. M. has extensive market gardens, and manufs. nets, twine, paper, wire, etc. Here is Loretto School (q.v.). The tn is celebrated for its golf links. Together with Craigentinny, Craigmillar, and Portobello, M. forms the burgh constituency of Edinburgh E. and returns 1 member to Parliament. Pop. 17,012.

**Musset, Louis Charles Alfred de** (1810-1857), Fr. poet, novelist, and playwright, b. Paris. In 1829 he met with great success, and at the same time with much hostile criticism, through his pub. of *Contes d'Espagne et d'Italie*. In 1830 his play, *La Nuit vénitienne*, was produced at the Odéon by Harel, but was not well

received. In 1832 he left the 'Cénacle,' the group of writers which had collected around the young Victor Hugo (q.v.) in about 1828, and which included Alfred de Vigny, Charles Nodier (q.v.), and others. In the following year he pub. *Un Spectacle dans un fauteuil*, which was so far successful that he was asked to contribute to the *Revue des deux mondes*. For this he wrote (in 1833) his fine tragical comedies, *André del Sarto* and *Les Caprices de Marianne*. His next contribution to the *Revue* was his famous poem *Rolla*, written also in 1833, at the beginning of his liaison with George Sand, whom he had met in the summer of that year. Later in the year



ALFRED DE MUSSET

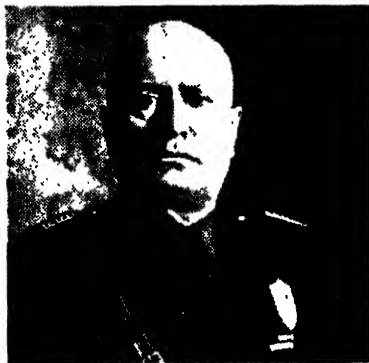
he left with her for Italy, and returned alone shortly afterwards broken in health and in spirit. The worst side of his moral character was brought out by his sufferings. George Sand gave her account of the catastrophe in a novel, *Elle et lui*, 1859, to which de M. replied in his *Lui et elle*, 1860. The four *Nuits—de mai, de décembre, 1835, d'août, 1836, and d'octobre, 1837*—reflect the bitterness of soul and disillusionment which ensued on the breach with George Sand and the ending of the romantic dreams of ideal love which they had founded on that relationship. In 1835 he produced *Lucie, Le Chandelier, La Loi sur la presse*, and, more important, *Confession d'un enfant du siècle*, which is of great interest in revealing the poet's complex character. In 1838 he was appointed librarian of the Ministry of the Interior, and 2 years later his health began to give way. Meanwhile he had written *Lettre à Lamartine*, 1836, the comedy *Il ne faut jurer de rien*, 1836, *Un Caprice*, 1837, some of the *Nouvelles*, 1837, and the fragment *Le Poète déchu*, 1839. In 1840 he wrote *A trente ans*, and in the following year the spirited poem *Le*

*Rhin allemand*. His latter years were comparatively unproductive, his works including *Il faut qu'une porte soit ouverte ou fermée*, 1845, *Bettine*, 1849, and *Carmosine*, 1851. He was elected to the Academy in 1852, and d. of heart disease 5 years later. Alfred de M. was, above all, a lyricist, whose one dominant theme was love in its varied manifestations. All his work is markedly subjective. Beginning life as an enthusiast, he early experienced a sad disillusionment, owing chiefly to his unhappy liaison, and his later work is characterised by a melancholy which is preoccupied with the darker problems of life and ends by wooing a despair which sees in its bitter-sweet memories the only thing worth having experienced. Complete eds. of his works have been pub. by P. Lemerre, 1876; E. Biré, 1907-8; M. Allem, 1933-8; letters by L. Seché, 1907. See studies by C. F. Oliphant, 1890; L. Seché, 1907; E. Henriot, 1929; H. O. Sedgwick, 1932; M. Allem, 1940; also P. Gastinel, *Le Romantisme de Musset*, 1933, and P. van Tieghem, *Musset, l'homme et l'œuvre*, 1945.

Mussolini, Benito Amilcare Andrea (1883-1945), 'Duce' or dictator of Italy; b. Varano di Costa, by Dovia, com. of Predappio, prov. of Forlì; elder son of Alessandro Gaspare M., a blacksmith and Socialist agitator, and a devoutly Catholic mother. M. attended an elementary school at Predappio, and, later, the Salesian school at Faenza. He worked for a time at his father's smithy. He then completed his education at the Royal Normal School of Forlì, and, later, at the school for training elementary school-teachers, and was for a year a teacher at Gualteri, Reggio nel' Emilia. In 1902 he went to Switzerland, and worked as a mason, translated, starved, made revolutionary speeches, and was arrested at Lausanne for vagrancy, but was befriended by Socialist organisations. In June 1903 he was expelled from the canton of Berne for revolutionary activities, and later in that year the news of his mother's illness caused his return to Forlì. He returned to Italy and served in a Bersagliere regiment in 1905-6. At the end of his military service he took a post as a teacher of Fr. at Oneglia, near Genoa, and at the same time conducted atheistic propaganda in the local Socialist newspaper. In 1910 he founded *La lotta di classe* ('The Class Struggle'), a weekly paper, at Forlì, using it as a vehicle for extreme Socialist and anti-clerical views. He suffered imprisonment for his articles, but at the end of 1910 he became secretary to the Socialist Society at Trent, then an Austrian possession. He voiced his inherent irredentism in the Socialist paper *Il Popolo* and was banished by the Austrian authorities (Oct. 1911). He then ed. the Socialist paper of Milan, *Avanti!* Up to the First World War he had been an extreme Socialist, using extremism as a lever by which to dislodge the moderate Socialist leaders and secure place and office for himself. At the outbreak of the war he advocated neutrality, and his sudden conversion (helped, it has

been asserted, by Fr. gold) to intervention on the Allies' side resulted in his expulsion from the Socialist party at a congress in Milan (Nov. 1914).

His expulsion by the Socialist Congress at Milan was the turning-point in his career. His old associates abandoned him in disgust; but M. was now the powerful owner and editor of a paper, for on 15 Nov. he had founded *Il Popolo d'Italia*, and through this he vehemently advocated It. participation in the fighting. When Italy declared war (May 1915) M., who could have claimed exemption as an



E.N.I.

BENITO MUSSOLINI

editor, volunteered as a private soldier in the 11th Bersaglieri regiment. His service ended in 1917 when he was severely injured in a firing exercise. In Sept. 1917 he resumed editorship of his paper, its chief use now being to combat pacifism, and for this purpose he collaborated with the *Fasci di Resistenza*, or 'Unions of Resistance,' organised for that specific purpose. With the war ended, the exceptional disorder that reigned in Italy favoured the growth of the strong counter-revolution M. had been preparing. He had now decided to form his own political group and this subsequently adopted the name *Fasci Italiani di Combattimento*, the term 'Fasci' being already in familiar use. Thus on 23 Mar. 1919 the Fascismo institution was founded; its activities, which were directed by M., are recorded under FASCISM. M. very soon dropped most of the original programme of the group; it was the blackshirts of d'Annunzio's *arditi* and their slogans, and also the gangster methods of their leader, that appealed so strongly to M., and he soon made these his own. By playing on the dangers of communism, M. soon acquired considerable passive, and some vital active, support from the It. industrialist class and from the self-employed middle classes. In spite of this his party only secured some 30 seats at the elections in 1921; but by Oct. 1922 his propaganda and shock

tactics had reduced the country to such a state of tension that he felt ready to attempt his *coup d'état*. At a Fascist congress in Naples (24-6 Oct.) he declared that the Fascists would assume power by force. But he took care to leave the march on Rome to be organised and carried out by others, he himself travelling to Rome by sleeping-compartment. The marching columns met with no opposition whatever, and eventually fewer than a large div. actually approached the cap. (28 Oct.). But the bluff succeeded. Had the king agreed, the regular troops under Radoglio (q.v.) could have dispersed the Fascist march in a few minutes. In the result, however, the premier, Facta, resigned and M. formed a coalition ministry with himself as Prime Minister, foreign secretary, and minister of the interior. But though so far he followed a conventional policy, humouring both king and church, he took care to convert his illegal armed bands into the legal Fascist militia and thereafter incited them to a course of violence. The murder of Matteotti (q.v.), the Fascist gov.'s ablest critic, a few days after he had launched a brilliant attack in the Chamber on the Fascist chiefs temporarily threatened M.'s political future; but the danger passed, and subsequent events were to show that his party secretary Farinacci was quite prepared to continue gangster methods on a still more thorough scale. M. himself escaped 3 attempts at assassination about this time (1925), but gradually he succeeded in transforming Italy into a totalitarian state with himself as dictator. The chief instruments in this process were the secret police and propaganda. M.'s remedy for Italy's unstable economic condition was to follow the path of economic self-sufficiency which inevitably led him to seek colonial expansion and eventually to embark on his aggressive policy against Ethiopia. In the first years of his regime, however, the majority of the It. people were probably satisfied with him. Administration was more efficient, industry apparently prospered, an ambitious and ostentatious programme of public works was begun, and Italy began to be regarded as a great power abroad—an important point, for many Italians felt they had been somewhat cold-shouldered at Versailles.

He soon deemed it politic to forget his crude atheism and to follow a policy of conciliation towards the Church. Thus he made a gift of the very fine Chigi collection of books and MSS. to the Vatican; hence too the inclusion of the mass in public ceremonies and the restoration of the crucifix to the schools. M. even submitted privately to having his own marriage blessed by the Church. M. then embarked on a solution of the 50-year-old problem, the Rom. question, i.e. the problem of the relations between the State and the Vatican. The ensuing negotiation resulted in the Lateran Treaty and Concordat (Feb. 1929), by which the papacy gave up its claim to the former papal dominions, retaining unrestricted sovereignty over a small area of Rome

thenceforth known as the Vatican City and receiving compensation in a large amount in cash and securities. M.'s dominant motive in concluding these accords with Pius XI was to bring the Church within the orbit and, as far as possible, the control of the totalitarian state, to enlist the support of the strongest and oldest force in the country, and to win the applause of Catholics all over the world. For the Catholic religion itself he probably cared nothing.

To further his aggressive designs on Ethiopia, he replaced Grandi by his son-in-law, Count Ciano. He had gradually relegated his other rivals to obscurity. Thus de Vecchi was sent to the Dodecanese as governor. Balbo (q.v.) was conveniently removed before he could bring to maturity his project of granting Libya independence, and Badoglio was deprived of all influence in Fascist circles. M., always contemptuous of legislative assemblies and cabinet gov., not only assumed office as Prime Minister, but took over the 3 service ministries and the Ministry of the Interior, while putting the Foreign Office under the puppet, Ciano.

Thus Italy's policy became essentially that of M. himself; but, with the rise of Hitler in Germany, his path became beset with ever-increasing difficulties. Faced with the alternative of giving up his aggressive dreams or supporting Hitler, he paid the heavy price involved in the latter choice. This included the abandonment of It. influence in Austria, which had become almost a satrapy of Italy. There were angry meetings between the 2 dictators in 1934, and later, when Hitler seemed to be preparing to march on Austria, M. massed his troops on the Brenner Pass. Nothing decisive happened at that time, but in 1936 M.'s diplomatic position had weakened as a result of his Ethiopian policy, which had estranged both Great Britain and France. He had, however, successfully conquered Ethiopia for Italy, and so, in the eyes of his fellow countrymen, avenged the humiliation of Adowa, 40 years before. M. now joined Hitler in supplying Franco with arms and men against the Sp. Republicans and so became a member of the Axis (q.v.) and a partner in the anti-Comintern Pact (q.v.). When therefore in 1938 Hitler actually marched into Austria, M. held aloof and, in the following year, the Berlin-Rome Axis became the so-called 'pact of steel.' In June 1940, with France approaching military collapse and the prospect of Great Britain's isolation, he declared war against both, hoping, 'like a jackal' (Churchill's description), to secure a cheap reward in the appropriation of Tunis, Cannes, and other portions of Fr. ter. However, in the course of the next 2 years he found himself at war with both Russia and the U.S.A. as well as with Britain, while the jealousy and ambition of Hitler, who soon became master of Italy after the It. debacle in Libya and Greece, precluded any possibility of Fr. spoils for Italy.

With the loss of It. E. Africa M.'s prestige began to wane even more sharply

than before his visit to Salzburg, which involved sending It. troops to uphold Hitler in his anti-Communist crusade. The plight of Italy became aggravated in early 1943 with the threat of invasion. By the end of Mar. M. sought to strengthen his control by reorganising the party directorate and by demanding a personal pledge of loyalty from all party leaders. But with the fall of Tunisia the situation grew steadily worse. In Mar. Hitler demanded the aid of It. troops to relieve Ger. garrisons in France and the Balkans; but M. needed all his military strength at home now that he had lost one army in Africa, besides the better part of 10 divs. roughly handed on the Russian front. In July, with the allied invasion of Italy well under way, the It. military authorities called for massive Ger. aid as the only hope of saving the country. This new request drove Hitler to extreme recriminations against his fellow dictator, and the only course left to M. was to concentrate on defending the Po valley and to leave the rest of Italy to its fate. Soon after M.'s report to the Fascist Grand Council of the outcome of his meeting with Hitler, Grandi, with the support of Ciano, Bottai (an ex-minister of education), and de Bono, led a revolt against him, and a demand for M.'s resignation, expressed in Grandi's motion that the king be invited to assume command, was carried by 19 votes to 7. On 25 July M. was summoned to the royal palace, informed of his dismissal, and taken into custody as he left. His fall meant the end of the Fascist regime. The king took command of the army, Badoglio (q.v.) was entrusted with the formation of a new gov., and throughout Italy spontaneous demonstrations bore witness to the relief felt by the people at the loosing of the Fascist bonds, a release as yet more apparent than real. M. was sev. times transferred from one place of detention to another and eventually to a clinic on the Campo Imperatore, near Aquila, in the Abruzzi Mts. It was from here that he was carried off in a daring raid by a strong Ger. parachute force. M. in Nazi hands became, as was no doubt intended by Hitler, a potential rallying point for the endangered Fascists, who had everything to lose from a change of regime or an allied victory. M. set up a Fascist rep. in the N. of Italy and early in the ensuing year (1944) Ciano was tried by a Fascist tribunal for his part in the overthrow of his father-in-law and shot. But gradually and inexorably, with the defeat of the Ger. armies in Italy, the partisans in the N. of Italy secured almost complete control of the situation, and M., now a sick man, tried to escape across the frontier into Switzerland. But he was betrayed to the partisans and arrested on 28 April 1945, and, together with some 12 members of his ex-Fascist Cabinet and his mistress, Clara Petacci, was executed by partisans, who carried the bodies of their victims to Milan for public display.

It has been said that if M. sought a model for himself he could have found it in the character of the tyrant as delineated

by Plato or Savonarola, and that nearly everything in his movement was borrowed from d'Annunzio. Though neither a deep nor original thinker, he acquired a hold over the It. people by the guns of his illegal bodyguard, the support of the army chiefs, big industrialists, and land-owners, the most unscrupulous propaganda, and flamboyant oratory. As a political showman his only rival was Hitler. His personal vanity was almost boundless, yet he had intelligence, powers of leadership, and could, on occasions, show streaks of unexpected sensitivity. Though in the first years of his dictatorship he appeared to confer many material benefits on Italy, his policy, from about 1935 onwards, in foreign affairs was disastrous, and left his country materially devastated and spiritually exhausted.

There is a copious bibliography on M. and Fascism, and most books, being written either to extol or to condemn, must be read with reserve. See his *My Autobiography* (trans. by R. W. Child), 1928; G. Megaro, *Mussolini in the Making* (to 1914), 1928; A. de Ambris, *Mussolini: la leggenda e l'uomo*, 1930; H. Finer, *Mussolini's Italy*, 1935; Margherita Sarfatti, *The Life of Benito Mussolini* (with a preface by him; trans. by F. Whyte), 1936; J. A. R. Marriot, *Makers of Modern Italy*, 1937; Angelica Balabanoff, *My Life as a Rebel* (comments on M.'s days in Switzerland), 1938; G. Pini, *Official Life of Benito Mussolini* (trans. by L. Villari), 1939; I. Thomas, *Who Mussolini Is* (Oxford Pamphlets on World Affairs, No. 59), 1942; M. H. Macartney, *One Man Alone*, 1944, and *Memoirs of Mussolini*, 1942-3, 1946; P. Saperito (Eng. trans.), *The Fall of Mussolini*, 1948; M. Muggeridge (ed.), *Ciano's Diary*, 1947, and *Ciano's Diplomatic Papers*, 1948; R. Dombrowski, *Mussolini: Twilight and Fall*, 1956.

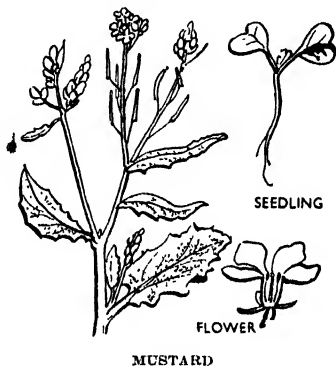
**Mussooree**, tn of Uttar Pradesh state, India, 130 m. NNW. of Ranipur. Lying on the foothills below the Himalaya at about 6500 ft. M. is a very popular hot-weather resort. It is directly above Dehra Dun.

**Mussorgsky, Modest Petrovich** (1839-1881), Russian composer, b. Karevo, Pskov, was at first a guards officer. In 1857 he began to study music under Balakirev (q.v.) and in 1858 resigned his commission, becoming a civil servant. A sympathy with common folk led him to write realistic songs, following the inflections of their speech, and he endeavoured to do the same with his operatic characters, succeeding in completing one great operatic masterpiece, *Boris Godunov*, produced in 1874 and sev. times revised. All the others remained incomplete, but *The Marriage, Khovanshchina*, and *Sorochintsy Fair* are performable in ed. versions. His life became more and more poverty-stricken; he took to drink, and d. from a spinal disease. The influence of folk-music upon his work was strong, especially in about 70 songs, the best of which are works of genius for character and atmosphere. His other best-known works are *Night on the Bare Mountain*,

for orchestra, and the piano suite, *Pictures at an Exhibition*. See M. D. Calvocoressi (ed. by G. Abraham), *Mussorgsky* (Master Musicians), 1946.

**Mustapha Kemal**, see ATATÜRK.

**Mustard**. The 2 M.s of importance are black M. (*Brassica (Sinapis) nigra*) and white M. (*B. (S.) alba*). The former is grown in Cams and adjoining cos. for the production of seeds, which are ground, and after removal of the dark-coloured testas are used as a condiment or are converted into M. oil. The brown or Indian M. (which is not cultivated in Britain) may be used for the same purpose. White M. is one of the quickest maturing crops grown in Great Britain and is commonly grown as a forage crop or green manure. The white



M. seedlings are commonly used in salads, and for the purpose should be sown 3 days after cress, with which M. is usually eaten.

**Mustard Gas** (dichloroethyl sulphide,  $(\text{ClH}_2\text{Cl-CH}_2)_2\text{S}$ , Yperite, **Yellow Cross**) was obtained by Richio, 1854, by the action of chlorine on ethyl sulphide. It was described by Guthrie, 1860, and prepared pure by Victor Meyer, 1886, by the action of ethylene chlorohydrin on sodium sulphide, followed by the action of hydrochloric acid. It was first used as a poison gas in the First World War by the Germans at Ypres, 12 July 1917. It was manuf. by the action of sulphur chloride,  $\text{S}_2\text{Cl}_2$ , on ethylene at  $30^\circ\text{C}$ . It is a light, yellow, oily liquid boiling at  $215^\circ\text{C}$ , and solidifying at  $14^\circ\text{C}$ . It is a powerful vesicant (blister producer), and affects the eyes and respiratory tract after a period during which the effects are not obvious.

**Mustique Island**, Grenadines, see ST VINCENT.

**Muswellbrook**, tn on Hunter R., in New S. Wales, Australia, 179 m. NNW. of Sydney. There are good coal deposits being worked and cattle are raised. Pop. 5730.

**Mut**, Egyptian mother goddess *par excellence*, represented as a vulture, and spouse of Amen-Ra of Thebes. She perhaps derived from Nekhbet, the vulture



goddess of el Kab and guardian deity of a prehistoric kingdom of Upper Egypt.

**Mutanabbi, Al-, Abu-'l-Tayyib Ahmed-ibn-Hosain** (915-85), Arabic poet. He was the leading figure in a galaxy of Arabic men of letters who gathered at the court of Sayf ad-Dawla, at Aleppo, the N. Syrian school of poets. He developed the qasida form of poetry to its fullest, and had a great influence on the early development of Persian poetry as well. In the Arabic world he is regarded as one of the greatest poets, though European critics differ on this. His name (Al-M. = 'would-be prophet') recalls an early escapade when he claimed to be a prophet.

**Mutation**, inheritable change in a characteristic of a plant or animal, by means of which evolution and the formation of new species are considered to take place. New species may arise through a large M. changing the characters very considerably, or through a succession of smaller M.s. M. is considered to be due to changes in the genes (q.v.); it has been produced artificially by the action of X-rays, and other radiations, and by the chemicals—colchicine and mustard oils. In nature, it is believed that cosmic rays (q.v.) are important agents. See EVOLUTION; GENETICS; HEREDITY; VARIATION.

**Mutator**, mercury-vapour converter, which can be used as rectifier (q.v.) or for converting d.c. into single- or 3-phase a.c., or single- into 3- or 6-phase a.c.

**Mutina**, see MODENA.

**Mutiny, Indian**, see INDIAN SUB-CONTINENT.

**Mutiny Act**. The first Mutiny Act, that of 1689, made it possible to keep a standing army in time of peace, not only by sanctioning its existence for the first time in England, but by providing for the punishment of mutiny and desertion with death, and empowering the Crown to commission courts-martial to deal with those offences in time of peace. From 1689 Parliament passed the Mutiny Act annually until 1831, when it was finally superseded and merged in the Army Act of that year, an Act which is also annually renewed. The Jacobite Rebellion of 1715 made it necessary to increase the stringency of the Crown's disciplinary powers, and accordingly the Mutiny Act of 1715 authorised the Crown to formulate Articles of War to regulate generally the forces in the U.K. in time of peace. Prior to that year the Crown could only issue such articles in times of war or rebellion. Among other things, the later Mutiny Acts provided for the punishment by courts-martial of persons guilty of embezzling military or naval stores. See Sir C. G. Robertson, *Select Statutes, Cases and Documents illustrating English Constitutional History, 1660-1832* (7th ed.), 1936.

**Mutsuhito** (1852-1912), known as Meiji Tenno, 122nd Emperor of Japan, b. Kyoto. He succeeded his father Komei in Jan. 1867. Before he was crowned radical insurgents from the S. seized his person on 3 Jan. 1868, and so overthrew the power of the Shogun (q.v.). M. was sagacious and strong-willed, and a fine soldier

and poet. The modernisation of Japan was his ruling ambition, and he travelled widely in the country to convince his people of its necessity. He enjoyed more esteem than any other Jap. emperor, and his death is regarded as the end of the Grand Era.

**Mutterstadt**, Ger. tn in the Land of Rhineland-Palatinate (q.v.), 40 m. S. by E. of Mainz (q.v.). Pop. 5000.

**Mutton-bird**, Australasian name for a shearwater or petrel used for food and valued for its oil and feathers. The sooty shearwater (*Puffinus griseus*) is the common M. of New Zealand and the short-tailed shearwater (*P. tenuirostris* or *brevicaudus*) that of Australia and Tasmania. The great-winged (*Pterodroma macroptera*), white-headed (*P. lessoni*), and Kermadec (*P. neglecta* or *phillipi*) petrels are also known as M.s. The origin of the name is uncertain. See W. B. Alexander, *Birds of the Ocean*, 1955, and W. R. B. Oliver, *New Zealand Birds*, 1955.

**Muttra**, see MATHURA.

**Mutual Inductance**, see COUPLED CIRCUITS.

**Muyra Language**, see SOUTH AMERICAN NATIVE LANGUAGES.

**Muzaffargarh**, tn of W. Pakistan, 20 m. SW. of Multan. It was here that Flora Annie Steel, the novelist, was an inspectress of schools.

**Muziano, Girolamo** (1528-92), It. painter, b. Aquafredda, and studied under Romanus. It was not until 1550, when he went to Rome, that he began to be noticed. His most famous work is 'The Raising of Lazarus', which was finally placed in the Quirinal Palace. The large fortune which he left was used to aid in founding the Academy of St Luke at Rome, where he d.

**Muztagh**, see KARAKORAM.

**M.V.D.**, Russian abbreviation for Ministry of Internal Affairs. For a short period in 1953 the ministry acquired great importance in the Soviet Union when it was fused after Stalin's death with the Ministry of State Security (see M.G.B.). In the struggle among Stalin's successors Beria (q.v.), who was the head of the M.V.D., used its apparatus to strengthen his own position. Soon after his downfall the security service was again separated from the M.V.D. and placed under the K.G.B. (q.v.).

**Myal**, quasi-religious movement of the slaves in Jamaica against the powers of Obeah (q.v.). The M. leader led dances by which a person harmed or killed by Obeah was restored to health. The M. leader was often in fact also an Obeah man, and the connection between them is not clear. See also POCOMANIA. See Martha Beckwith, *Black Roadways*, 1928.

**Mycellium**, see FUNGI.

**Mycenae**, one of the oldest cities of ancient Greece, dating from at least the third millennium BC, was situated in a very strong position on the hill overlooking the N. extremity of the Argive plain. In 468 BC M. was dismantled by the people of its ancient enemy Argos, and was never rebuilt. In the time of Pausanias the

ruins consisted of a great part of the walls, with the so-called Lion Gate, the fountain called Perseia, and the 'beehive' tombs. The discoveries which have been made here between 1876 and the present day have greatly increased the knowledge of Aegean civilisation (q.v.). See H. Schliemann, *Mycenae*, 1878; M. P. Nilsson, *Homer and Mycenae*, 1933, and *Minoan-Mycenae Religions*, 1950; A. J. B. Wace, *Mycenae*, 1949; for an account of the language of the ancients Mycenaeans, see M. Ventris and J. Chadwick, *Documents in Mycenaean Greek*, 1956.

**Mycenaeae Civilisation**, see AEGEAN CIVILISATION.

**Mycetozoa**, see MYXOGASTRES.

**Mycoderma**, genus of fungi, some causing fermentation, such as *M. vini* in wines and *M. cerevisiae* in beer, forming a skin on the liquids. *M. aceti* of vinegar is now *Acetobacter aceti*.

**Mycological Institute**, see COMMONWEALTH MYCOLOGICAL INSTITUTE.

**Mycology**, branch of science for fungi. The Commonwealth Mycological Institute (q.v.) at Kew co-ordinates information on plant diseases with the work on insect pests of the Commonwealth Institute of Entomology (q.v.) and that of the various Imperial agric. bureaux located at research stations. The Mycological Institute is now under the control of the executive council of the Commonwealth Agric. Bureaux.

**Mycorrhiza**, association or symbiosis between the root-cells of a plant and the mycelium of a soil fungi by which both are benefited. It is important in many plants, including orchids, heaths, conifers, and many other trees and plants. See M. C. Rayner, *Trees and Toadstools*, 1946, and M. C. Rayner and W. Neilson-Jones, *Problems of Tree Nutrition*, 1947.

**Myddelton, Sir Hugh**, see MIDDLETON.

**Myelitis**, inflammation of the spinal cord. The nature of the infection causing M. is not known, but it is probably most often due to a virus. There are 3 recognised forms: (1) *acute ascending M.*, rapidly progressive, febrile, and causing ascending paralysis and anaesthesia; (2) *disseminated M.*, widespread and affecting the nerve tissue of the brain in addition to that of the spinal cord; and (3) *transverse M.*, a lesion right across the spinal cord at a certain level characterised by paralysis and anaesthesia below the level of the lesion and loss of control of the sphincters.

**Myers, Frederic William Henry** (1843-1901), Eng. essayist, poet, and author, b. Keswick. M. was the leading spirit, with H. Siddgwick, R. Hodgson, R. Gurney, and F. Podmore, in founding the Society for Psychical Research in 1882. His main works include *Catholic Thoughts*, 1873, *Essays Classical and Modern*, 1883, *Phantasms of the Living*, 1886, *Science and a Future Life*, 1893, and the posthumous *Human Personality and its Survival of Bodily Death* (2 vols.), 1903.

**Myitkyina**: 1. Most northerly dist. of Upper Burma, Mandalay div., 10,640 sq. m. in area. Indawgyi Lake is in the SW.

The tn is the limit of navigation on the Irawadi, and the terminus of the railway running N. from Mandalay. It was lost to the Jap. invaders early in 1942. In Mar. 1944 it had become the immediate goal of the allied counter-offensive, their troops being by then firmly placed across the main routes by road and rail and riv. linking M. with its supply bases in the S. By the end of April Gen. Stilwell's forces were within 40 m. of M., though they met with tenacious Jap. resistance. On 17 May, after a forced march over 110 m. of mt and jungle in 20 days, an Amer. force under Gen. Merrill suddenly descended on the airfield 2 m. S. of M. and wrested it from the surprised defenders. The Japanese, however, still clung to M., and it was not until 3 Aug. that the tn was finally taken, following a siege of two and a half months. Pop. 70,000. See further under BURMA, SECOND WORLD WAR, CAMPAIGNS IN.

2. State cap. of the Kachin state, a constituent state of the Union of Burma, and also the H.Q. of the M. dist. Prin. products are rice and timber. There is also a large sugar factory at Namti in the M. dist.

**Myjava**, Czechoslovak tn in the region of Bratislava (q.v.). It has textile manufs. Pop. 9900.

**Mykolayiv**, see NIKOLAYEV.

**Myrae**, see MILAZZO.

**Myllitta**, Babylonian goddess in Babylon, mentioned only by Herodotus and probably a reference to Ishtar or Astarte, goddess of love.

**Mylonite**, rock formed by the grinding and shearing of the rocks of the earth's crust under the forces of intense earth movements. M.s occur in the NW. highlands of Scotland.

**Myna**, or **Grackle**, genus of birds of the starling tribe, having dark-brown plumage, with white markings on tail and wings.

**Mynddislwyn**, urb. dist. of Monmouthshire, England, 13 m. from Newport and 7 m. from Pontypool. It is on the S. Wales coal-field, and has manufs of switchgear, confectionery, and furniture. Pop. 15,000.

**Myogen**, see MYOSINOGEN.

**Myopia**, or **Short-sight**, defect in vision due to a faulty structure of the eye. Parallel rays of light are brought to a focus in front of the retina owing to excessive length of the eye from the surface or the cornea and a too great convexity of the crystalline lens. Thus an indistinct image is thrown on the retina. This defect is corrected by the use of spectacles with concave lenses. The concavity of the lenses is adjusted so that parallel rays are focused on the retina as in ordinary vision. M. often has hereditary connections, and children of myopic parents should have regular examination of their eyes. See under REFRACTION, ERRORS OF.

**Myosinogen**, or **Myogen**. M. and paramyosinogen are the 2 soluble proteins present in muscle in the proportion of 4:1. They are of globulin nature and readily coagulate through heat. This

coagulation change is reversible during life, but at death an irreversible coagulation occurs (*rigor mortis*), which is only removed by the solution of the protein through the action of proteolytic enzymes.

**Myosis**, condition of the eye in which the pupil is abnormally contracted and lacks its power of accommodation. It may be produced by use of certain drugs, e.g. opium.

**Myosotis**, see FORGET-ME-NOT.

**Myriapoda**, class of arthropods which comprises the Chilopoda or centipedes and the Chilognatha (Diplopoda) or millipedes. The body is long and flattened or cylindrical, and the legs are numerous, though, of course, not so numerous as the popular names suggest. In their internal anatomy they resemble the Insecta, with which they have such other features in common as respiration by tracheal tubes and the possession of 2 antennae on the head, but the segmented body exhibits no distinction between the thorax and the abdomen, while wings are always absent. Their range is very extensive, and they live in dark places, as under stones, heaps of leaves, masonry, and the bark of trees. Some possess powers of luminosity. The centipedes are always flattened and are characterised by a single pair of legs to each segment, the first pair being capable of inflicting poisonous wounds; they are all carnivorous. Millipedes live on vegetation, and apparently have 2 pairs of legs attached to each segment, but the segments are not perfectly separated; the bodies are round. Some foreign species attain a length of sev. inches. See also ARTHROPODA.

**Myrica**, family Myricaceae, genus of shrubs or trees of temperate or sub-tropical regions; often fragrant, with unisexual flowers. *M. gale* is the Bog Myrtle of Britain; *M. cerifera*, the Wax M.; *M. californica* and *M. pensylvanica*, bay-berries of N. America.

**Myristica**, tropical trees of the family Myristicaceae, yielding the nutmegs and mace of commerce, and oils and fats. *M. fragrans* yields the best nutmegs and mace, as well as an essential oil used in soap-making and perfumery. *M. officinalis*, of Java, Sumatra, and Celebes, yields nutmeg or mace butter, used in pharmacy. *M. cuba* of S. America is used for candle-wax.

**Myrmidones**, an Achaean race which inhabited Phthiotis in Thessaly. Their name is derived from an ancestor, begotten of Eurymedusa by Zeus in the form of an ant, or from the legend of the re-peopleing of Aegina with ants, changed by Zeus into men. In England the term M. is used for a ruthless subordinate, from the loyalty of the M. to Achilles. See *Iliad*, ii. 68 and Strabo, viii. 375; ix. 433.

**Myron**, Gk sculptor of the 5th cent. BC, b. Eleutheræe, on the borders of Boeotia and Attica. He worked almost exclusively in bronze, and was a late contemporary of Phedias (q.v.); he made statues of the athletes Timanthes (456) and Lycinus (448), excelling in the representation of movement. The 'Discobolus' at Rome is one of that city's most

important statues because it is not, like so many others, a Rom. copy of a Gk original, but if not the original work of M. is at least a very early Gk copy of it. There is a cast of a 'Discobolus' of his with the head put on wrongly in the Brit. Museum. See P. E. Arias, *Mirone*, 1940.

**Myronides**, Athenian general of the 5th cent. BC. In 459 he repulsed 2 Corinthian attacks on Megara, and by the victory of Oenophyta (456 BC) over the Spartans obtained the submission of Boeotia (except Thebes), Phocis, and Locris.

**Myrrh**, the aromatic gum-resin of *Anartum* (*Balsamodendron*) *myrrha*, tree of Arabia and Ethiopia; used in incense, for perfumery, and at one time in embalming.

**Myrrhine Vases**, see MURRHINE.

**Myrrhis**, Myrrh, or Sweet Cicely, small genus of umbelliferous perennial plants. *M. odorata*, a tall, aromatic plant with large tripinnate leaves and umbels of white flowers, is British, and was formerly much used as a pot herb and in salads. See MYRRH.

**Myrtle**, or *Myrtus*, genus of shrubs or trees with white fragrant axillary flowers and ornamental leaves, which are also fragrant. The common M. (*M. communis*) and its numerous varieties are hardy in mild sheltered positions. Its leaves are distilled to yield the perfume Eau d'ange.

**Mysia**, in anc. geography, was a dist. in the NW. of Asia Minor, peopled by the Mysi from Thrace. The N. portion was called M. Minor, the S. M. Major. The chief towns were Pergamum and Cyzicus.

**Mysłowice**, tn of Poland, in Katowice prov., on the Przemsza, 5 m. E. of Katowice (q.v.). It was in Germany until 1919. There are zinc- and coal-mines, and textile and chemical industries. Pop. 25,000.

**Mysore**: 1. State of India, enlarged since 1956 to include the whole of the Kanara country, and covering the former princely state of M. lying in the S. part of the Deccan plateau and along part of the W. Ghats, the Kanarese dists. of Bombay and Madras respectively lying along the W. coast, the Kanarese dists. of the old state of Hyderabad in the Deccan, and the hill state of Coorg. Most of the state is hilly or highland with an agreeable climate, save in the more arid regions obtained from Hyderabad; the coastal belt gets the full force of the SW. monsoon and a heavy rainfall.

**History**. In ancient times M. was ruled by the Kadamba dynasty mentioned by Ptolemy. It was part of the great empire of Vijayanagar through the Middle Ages. In 1610 the Wadiyar (chieftain) of Mysore seized Seringapatam and estab. the Hindu dynasty of Mysore. Haldar Ali usurped the throne in the mid 18th cent., his son Tipu Sultan was defeated in the last M. war, and Purnaiya, the Brahmin minister of the usurpers, reorganised the state for the old Hindu dynasty till the heir came of age. He did this very ably, but misrule by Krishnaraja Wadiyar led to Brit. intervention in 1831. M. was restored to a new representative of the Wadiyars in

1881 and developed under able diwans (ministers) to become India's model state, in many respects ahead even of the Brit. provs. M. had a form of representative gov. even before 1917. After Indian independence, M. became a member state of the union with the maharaja as rajpramukh (governor of princely rank). In the reorganisation of 1956 the state was enlarged to meet the demand of the Kanarese-speaking peoples for their own state, the maharaja becoming its governor.



E.N.A.

BRAHMIN OF MYSORE READING THE SACRED BOOKS

**Development.** State and private enterprise had done much for M. in the past. It produced rice and ragi, oilseeds, cotton, and other food crops; it had tea and coffee estates; and it was developing its quite considerable forest resources. It had a varied industrial development—textile works, silk filatures, tobacco factories, the main gold-field of India, engineering works, the first aircraft plant in India, iron and steel works at Bhadravati, manganese mines, and a promising electrical industry. It had pioneered hydro-electric development in India, especially rural electrification, by means of big schemes like Sivassamudram and the Jog Falls. M. and Bangalore were models of city planning and improvement. Independence has seen progress maintained. India's state telephone works are at Bangalore. The new dists. bring in wheat- and jowar-growing areas, a new gold industry from Hyderabad; most important, for the first time in modern times, a stretch of sea coast with promising ports at Karwar, Bhatkal, Mangalore, and Malpe, and good fisheries.

**Culture.** Kanarese is the language of the great mass of the people. There are 2 univs.: M. (estab. 1916, and having 44 affiliated colleges) and the Karnatak Univ., started in 1949 in the Kanarese dists. of Bombay.

**Government.** The governor acts through ministers responsible to an elected assembly of 208. There is also an upper house, the Legislative Council of 52 members. M. has 12 representatives in the Upper and 26 in the Lower House of India's parliament. The cap. is Bangalore (pop. 779,000). Other big towns are Mysore (pop. 244,000, see below), Hubli (pop. 130,000), Kolar Gold Fields (pop. 159,000), and Mangalore (pop. 117,000). Area 72,730 sq. m.; pop. 19,000,000.

2. Former cap. of the above state, situated 10 m. SW. of Seringapatam. It is a city of no particular architectural distinction, but graciously laid out with wide streets and spacious buildings. Situated at 2500 ft. M. is dominated by a long, precipitous hill, Chamundi, rising to 3500 ft. the top being reached by a good motor road. Part way up is a colossal figure, hewn out of the solid rock, of Nandi, the sacred bull of Shiva, d. 1659. M. being well lit by electricity, the view of it from the top by night is striking. It has long been known for its magnificent processions and festivities at the ann. Dasara festival. In the maharaja's palace is a fine throne of figwood overlaid with ivory, gold, and silver in Hindu designs. The origin is uncertain. There is a univ. (1916), and a large sandal oil factory.

**Mysore Thorn, see CAESALPINIA.**

**Mystagogue,** person who in the Gk mystery religions supervised the preparation and instruction of those seeking initiation.

**Mystery** (Gk 'a secret'): 1. In Christian theology a truth which cannot be known by the human reason unaided by revelation, and which even when revealed transcends human comprehension, e.g. the Trinity, the Incarnation. The great M. of which St Paul speaks in Eph. 1 was the admission of the Gentiles to God's Israel, the Church—a divine purpose kept secret until Pentecost, though foretold in prophecy and in the teaching of Christ. The Christian Eucharist (q.v.) is frequently called the Holy Mysteries, partly because of its sacramental character, and partly because in the early Church the unbaptised were not fully admitted to it. This is a sense of the word M. akin to the second meaning.

2. A doctrine and its accompanying rites kept secret from all but the initiates and having a saving if not immortalising effect upon them.

3. It is necessary to distinguish M. in these 2 senses from that derived from Lat. *ministerium*, It. *mestiere*, a trade or craft, and more properly spelled 'mystery' (whence M. plays (q.v.), those acted by trade guilds).

Among the Babylonians scholars detect a M. rite in the second sense in the pantomimes which illustrated the myth of Tammuz and Ishtar. It is, however,

doubtful whether we have here a true M., since the doctrines inculcated by these rites were not themselves secret, and the rites purported to do no more than to solace the dead. The earliest M.s of which we have certain evidence, at least as early as 1875 bc, are those connected with the legend of Osiris. In Greece certain public cults had secret rites attached to them, such as the Arrephoric and Thesmophoric festivals at Athens. But the prin. Gk M.s were the Eleusinian and Adanian and the originally non-Hellenic Kabeiroi of Samothrace. These were local, whereas the more emotional and lloentious Dionysiac and Orphic M.s were practised by societies which sprang up in various parts of the Hellenic world. In the 2nd cent. bc, on the break up of the Alexandrian Empire and the beginning of the Graeco-Rom. period, there was a revival of M. religions which exerted mutual influence upon one another. To this period belongs the cult of Mithras which appears to have made a particular appeal to the Rom. legions, who carried it with them wherever they went. The M. religions offered to their initiates salvation through communion with some saving deity. In Mithraism the initiate passed under a blood bath, streaming from a bull sacrificed overhead. Naturally little is known of initiatory rites; they included sacred lustrations and meals, but the attempt to detect any influence of them on Christian teaching or sacraments has failed. If there was influence, it seems to have been in the other direction. The initiation of a 'mystic' was followed by the enlightenment (*epopteia*) in which the doctrine was revealed by a solemn ritual which seems always to have included dancing. See F. Cumont, *Textes et monuments figurés relatifs aux mystères de Mithra*, 1896-9; R. Reitzenstein, *Die hellenischen Mysterienreligionen*, 1910; H. A. A. Kennedy, *St. Paul and the Mystery Religions*, 1913; J. Leplat, *Die Religion in der Umwelt der Urchristentums*, 1926; A. E. J. Rawlinson, *Essays Catholic and Critical*, 1920; O. Bauhofer, *Das Geheimnis der Zeiten*, 1935.

**Mysticism** (Gk *mysterion*, secret or hidden), belief in spiritual apprehensions of truths beyond the understanding, can hardly be said to be either a philosophy or a doctrine. It may be said to be a tendency in religious feeling, a temper, or an atmosphere. The starting point in M., and its goal, is that unity underlies diversity. So M. has been defined as an 'attitude of mind founded upon an intuitive or experienced conviction of unity, of oneness, of alikeness in all things.' M. leads to a belief that all things are manifestations of the divine life, and that the spirit is the only eternal thing, and, further, since unity underlies all, man has some share of the nature of God, and through this God-like part of him can apprehend God; for as through the intellect we apprehend material things, so through the soul can we apprehend the spiritual. Reason is not a part of M. According to M. we can only know a thing spiritually by *being* it, and therefore

the aim of a mystic is to attain union with the divine, and life becomes one long aspiration, and reality or truth ever and ever deepens and expands. M. appears in Buddhism and Hinduism, and may be said to have arisen in Europe with Plato, although Plotinus, the founder of Neo-Platonism, was the first great European mystic. Then came the Christian mystics of the Middle Ages, headed by St Augustine and the Syrian monk who ascribed his work to Dionysius the Areopagite, and the great Irish philosopher, Scotus Erigena, who trans. Dionysius into Latin from the Greek. In the 12th and 13th cents. may be mentioned St Bernard of Clairvaux, Richard of St Victor, and St Bonaventura, and in the 14th cent. Richard Rolle, Walter Hilton, Julian of Norwich, John of Chur, and Thomas à Kempis. The Christian M. evolved by these was based on the adoptive sonship of God attained by man through Christ the God-man. Christian M. is thus a deeper realisation of this supernatural unity of man with God through Christ which is finally consummated in the beatific vision. Later we find Paracelsus, Bruno, Campanella, Boehme, Schelling, and Swedenborg. In England we have the Cambridge Platonists, including Henry More and John Smith, and later Wm Law and Blake. See also CARBALA; QUIETISM; ROSICRUCIANS; THEOSOPHY; and the articles on the various religions and persons mentioned above. See W. R. Inge, *Christian Mysticism*, 1899, 1948, *Studies of English Mystics*, 1906, and *Mysticism in Religion*, 1947; C. F. E. Spurgeon, *Mysticism in English Literature*, 1913; R. Nicholson, *Mysticism in Islam*, 1921; E. C. Butler, *Western Mysticism*, 1922; F. von Hügel, *The Mystical Element of Religion*, 1923; Evelyn Underhill, *Mysticism*, 1924, 1952, *The Mystic Way*, 1930; E. Brunner, *Die Mystik und das Wort*, 1924; J. H. Leuba, *Psychology of Religious Mysticism*, 1935; A. Hopkinson, *Mysticism Old and New*, 1946; T. Merton, *Ascent of Truth*, 1951.

**Mytens**, or **Meytens**, Daniel (1590-1642), Dutch portrait painter, b. The Hague, came to England and became portrait painter to Charles I. When Van Dyck was made the king's prin. portrait painter M. wished to go, but was prevailed upon by the king to stay until about 1630, when he returned to Holland. He painted portraits of many notable persons, including Charles I (in Buckingham Palace), the Duke of Portland, the Earl of Craven, etc.

**My-tho**, cap. of M. prov., and a port, situated on l. b. of the N. branch of the R. Mekong (q.v.) delta in Cochín-China (q.v.), 35 m. SSW. of Saigon. The prov. produces rice, coco-nuts, areca-nuts, betel, oranges, bananas, maize, tobacco, and sugar-cane.

**Mythology** (Gk *mythos*, *logos*: storytelling, or a rationale of stories): (1) imaginative traditions concerning the gods and other supernatural beings; (2) the study of these myths. M. is sometimes distinguished from legend as being entirely fictitious and imaginary, whereas legend is woven around an historical figure

or nucleus: e.g. the tale of Troy and the Arthurian romances are legend, not M. The dividing line, however, is hard to draw, for myth and legend are often closely interwoven (cf. Santa Claus), and behind the purest myth there often lurks prehistoric truth. Indeed to become established as a myth must first be widely accepted as true. The great myths are all deserving of respect if not reverence. They are poetic expressions of early man's profoundest intuitions about the universe and life. A M. indeed is to some extent a necessity as the background to a culture, and even to a reasonably satisfactory human life. Plato, while critically demolishing the ancient Hellenic M., declared that the philosopher would have to invent other truer myths to take its place, and himself essayed the task, e.g. in the *Timaeus*, the *Phaedo*, and the *Symposium*. Christianity (with Judaism), being an 'historical' religion, uniquely offers a *mythos* consisting of historical facts and events: but it too has its inspired M. of the poetic and theological and non-historical, non-factual kind, the stories of Creation, of Eden, of the Serpent, of the Trees of Knowledge and of Life, of the Rainbow, etc. M. then is not (as commonly supposed) confined to an early stage of society, for it still permeates our own, and that even in the form of non-Christian folklore, e.g. concerning fairies.

Plato was not the only one in ancient times to criticise the M. of his day. The theories of Euhemerus (q.v.) on the subject were radically destructive and are still influential in modern times. In 1825 K. O. Müller (in *Prolegomena zu einer wissenschaftlichen Mythologie*) explained M. as a disease of language, the names of the gods merely expressing natural phenomena. It was not until the late 19th cent. that serious and respectful attention began to be paid to the comparison and elucidation of the world's mythological riches. Lang and Frazer alike interpreted M. in terms of savage life and experience. W. Schmidt in his *Ursprung der Götteridee*, 'Origin and Growth of Religion', 1931, admirably reviews the various theories advanced to account for the origin of religion and its M.

*Myth in primitive societies.* Much anthropological work has been done on M. among primitive peoples, where it is clear that myths have an important social function as providing a *raison d'être* for the society and its institutions (e.g. the distinction between chiefs and commoners, or the possession of land or magical powers by certain families, etc.). In this light the historical truth or otherwise of a myth is irrelevant, and questions about such matters are based on a misconception of the true nature of M. Indeed modern myths in W. societies have the same function, as can be seen in the case of racialist M. in Nazi Germany and in S. Africa about the inferiority of Semitic or Negro peoples: M. provides a rationale for social behaviour without any necessary basis in scientific fact.

*Classification of deities.* The deities of

various M.s fall into well-defined classes. In all systems we have war-gods, water-gods, wind-gods, thunder- and lightning-gods, gods of agriculture and the chase, gods of death, and many other mythic conceptions. Many of the deities of certain systems combine 2 or more of these. We find war-gods who are also gods of agriculture, and wind-gods or thunder-gods who are gods of the chase. Deities of death often preside over agriculture; the seed arises from their subterranean domain.

*Cosmogony.* An important dept of M. deals with the primitive notion of the world and its creation, and the origin of man. The likeness between cosmological myths in all parts of the world is extraordinary, and cannot be accounted for by the theory of circulated or borrowed conceptions. See also COSMOGONY.

*Celtic mythology* can be gleaned from the remains of altars and images in France and England, and from the mythological tales of Wales and Ireland. Most of its gods, however, were tribal or local in character. In ancient Gaul we find Ogmios equated by the Romans with Mercury, and Borvo, Belenos, Grannos, and many more—all local gods—with Apollo. The martial Gauls had many warlike deities: Camulos, Albiorix, Caturix. Animal and nature gods abounded, like Mullo, a mule-god, Vintius, a wind-god. 'Corn-mothers' were numerous and local, e.g. Berecynthia of Autun. In myths of Ireland we find supernatural races, such as the Fomorians, Firbolgs, and Tuatha Dé Danann, which probably represent the pantheons of emigrant races. The most prominent Fomorian was Balor, a personification of the evil eye; Bres, the god of night, or perhaps of growth; and Donnán, a goddess of the depths of the earth. Of the Tuatha Dé Danann, 'the folk of the goddess Danu,' the principal deities are Dagda, the most important of all Irish gods, probably an earth or agricultural deity; Oengus, son of Dagda, a god of growth; Nuada 'of the Silver Hand,' perhaps a harvest god; Manannán, god of the seas; and Lug, the sun-god. The principal Celtic gods found in the Welsh *Mabinogi* and other myths were Llyr, god of the sea, and his sons, Bran and Manawyddan; Dôn, the equivalent of the Irish Danu; Gwydion, a Celtic Proteus; Arianrhod, an earth-goddess; and Gwannon, a sort of Vulcan. In the Arthurian romances we find many mythological characters disguised.

*Egyptian mythology* shows us the primitive conceptions of totemism, animism, and the like still surviving but with, superimposed upon them, the philosophical beliefs of a priestly class which has arrived at a higher theological capacity. Unable to impart their abstract beliefs to the ignorant, the priestly caste retained such of the early popular beliefs as seemed good to it, and employed them symbolically to inculcate higher religious thought. Herodotus explains that the apes and other animals kept in captivity by the Egyptian priests were in no wise regarded as idols, but as typifying the

multifarious attributes of deity. The gods of Egypt were arranged in triads. Egypt was subdivided into nomes or provinces, each of which possessed its triad of gods. Thus Osiris, Isis, and Horus (q.v.) at one time presided over a nome, but later, because of their popularity, became national gods. The myth of Osiris, his birth, reign, and death, typifies the daily journey of the sun. His wife, Isis, and their son, Horus, lost all their original characteristics when interwoven with the Osiris myth. Nephthys (q.v.), sister to Isis, probably represents the sunset. She was wife to Set (q.v.), brother to Osiris and god of darkness, who finally triumphed over him. Wisdom was personified in the god Thoth (q.v.), called by the Greeks Hermes Trismegistos. Anubis (q.v.), or Anpu, god of the lower regions, and the patron of embalming, was figured with the head of a jackal. Bubastis (q.v.), the cat-headed, represented the heat of the sun. Besides these a large number of the kings of Egypt were deified. A vast and cumbersome ritual crystallised round this M., represented in the *Book of the Coming Forth by Day*, which deals with funerary practices. It is, in fact, a guide to the soul after death through Amenti, the sad underworld of the dead.

*Myths of Greece and Rome* may be considered together, as in many cases their deities are interchangeable. There is a well-defined pantheon ruled over by the sky-god, Zeus or Jupiter, who has supplanted an older generation of divine beings, and wields thunder and lightning. With his wife, Hera or Juno, he rules the other gods, many of whom are related to him. Hephaestus, the god of smiths, and Vulcan, the Rom. god of devouring flames, are the craftsmen or artificers—though Vulcan's surname Mulciber indicates rather a power of quelling conflagrations. Pallas Athene or Minerva presides over wisdom, but has also something of a martial character. Ares or Mars is the god of war. Aphrodite or Venus presides over love, and Hermes or Mercury acts as messenger between gods and men. Apollo is the god of song and art. Innumerable tales circle around these beings, tales which for beauty have never been equalled in any M. But the Greek mind speedily discerned the insubstantial nature of the system it had evolved, and early doubts were expressed concerning the existence of the gods. No M. ever reached such perfection or underwent such rapid collapse as that of Hellas. The M. of Rome, built by sterner and more conservative folk, held its own for a little longer, but too crumbled speedily before the advance of monotheism. See individual articles on gods and myths.

*Hindu mythology.* The M. of the Aryan conquerors of India is polytheistic. The head of their pantheon is Brahma, whose leadership is frequently threatened by other powerful gods. The fullest account of the Hindu M. is to be found in the Vedic hymns. See HINDUISM.

*Semitic mythology.* In early Semitic M. polytheism displayed many of the features

of totemism and animism. There was also a widely distributed system of pillar worship, and each 'high place' and mt. possessed its special deity or ba'al. The religions of Babylonia and Assyria were wildly polytheistic, including as they did gods which represented every attribute and phase of deity. In Babylonian myth we find a great triad, Anu, En-lil, and Ea, at strife with darker deities, Apnu, Tiamat, and Marduk. The title Bêl was given to all gods alike. Dagon was probably a corn god. One of the prin. Assyrian deities was Ishtar, the wife of Marduk and the goddess of love and fruitfulness. Ashur, the local god of the city of that name, became the head of the Assyrian pantheon, and the national god of war. There were many smaller gods of only local significance. See also ASTARTE; COSMOGONY; ISRAEL; TAMMUZ; and individual names.

*Teutonic mythology* placed at the head of its pantheon Odh, or Wotan, the All-Father, who presided over the destinies of both gods and men. He possessed all the characteristics of a sun and sky god. His consort, Frigga, typified the Scandinavian matron and housewife. Thor was god of thunder, the Scandinavian Vulcan. Tyr was the sword-god and god of war, Loki the mischievous god of evil, Balder the graceful god of light and summer, whose myth typified the death of that season. The Scandinavians imagined that the *aesir*, or gods, dwelt in Asgard, at the top of the world-tree, Yggdrasil. Round this tree coiled the great world-snake. At its roots dwelt Hel, the dark goddess of death. In Midgard dwelt the race of men. But in the Norse conception even Asgard and its deities would not endure for ever. On the contrary, before the eyes of the gods there ever loomed a day of doom, when after the battle of Ragnarök they and the powers of evil would mutually destroy each other, darkness and chaos prevail, and a new heaven and earth be born, free of all toil, pain, and sin, created by the Supreme Being, Alfadir ('All-Father'). See also BRUNHILDA; FREYJA; NIBELUNGENLIED; VALKYRIES; and other names given above.

See G. W. Cox, *Mythology of the Aryan Nations*, 1870; Sir E. B. Tylor, *Primitive Culture: the Development of Mythology and Philosophy*, 1871; J. Dowson, *Classical Dictionary of Hindu Mythology*, 1879; W. J. Wilkins, *Hindu Mythology*, 1882; A. Lang, *Custom and Myth*, 1884, *Myth, Ritual, and Religion*, 1899, and *Tales of Troy and Greece*, 1925; W. H. Roscher, *Ausführliches Lexicon der griechischen und römischen Mythologie*, 1884-1925, and supplement by O. Gruppe, *Geschichte der klassischen Mythologie und Religionsgeschichte*, 1921; A. V. Rydberg, *Teutonic Mythology*, 1889; W. Smith, *Classical Dictionary of Greek and Roman Mythology*, 1894; F. M. Müller, *Contributions to the Science of Mythology*, 1897; E. A. W. Budge, *The Gods of the Egyptians*, 1904; A. Erman, *Handbook of Egyptian Mythology*, 1905; C. Squire, *Mythology of the British Islands*, 1905; Sir J. G. Frazer, *The Golden Bough*, 1907-15; J. MacCulloch,

*Religion of the Ancient Celts*, 1911; D. A. Mackenzie, *Indian Myth and Legend*, 1913; A. B. Cook, *Zeus*, 1914-1940; L. H. Gray, J. MacCulloch, and G. F. Moore (ed.), *Mythology of All Races*, 1916-32; E. Cassirer, *Sprache und Mythos*, 1925; J. E. Harrison, *Mythology*, 1925; B. Malinowski, *Myth in Primitive Psychology*, 1925; L. Spence, *Myths and Legends of Ancient Egypt*, 1925, and *Hero Tales and Legends of the Rhine*, 1927; H. J. Rose, *Handbook of Greek Mythology*, 1928; W. Schmidt, *Ursprung der Gottesidee*, 1926-35; P. Colum, *The Children of Odin*, 1929; H. A. Guerber, *Myths of the Norsemen*, 1929; T. W. Rolleston, *Myths and Legends of the Celtic Race*, 1929; E. O. James, *Comparative Religion*, 1938; C. G. Jung and K. Kerényi, *Einführung in das Wesen der Mythos*, 1941; C. Seltman, *The Twelve Olympians*, 1952; E. Sykes, *Dictionary of Non-Classical Mythology*, 1952.

**Mytilini**, or **Kastro**, name of one of the 3 dists. and also of its cap. in the is. of Lesbos. The latter is divided into Molyvo in the N., Calloni in the W., and Kastro in the E. M., or Kastro, the chief tn of this dist., is built in the shape of an amphitheatre surrounding a small hill surmounted by an anct fortress. It was at first situated on an is. close to the E. coast of Lesbos, but as the tn grew the is. were joined by a causeway, and M. expanded along the coast. During the Peloponnesian war the tn revolted, and was besieged from 429 to 427; it was the scene of a battle between Callicrates and Canon in 405. Pompey raised M. to the status of a free community. Pop. 31,000.

**Mytishchi**, tn in the Moscow oblast of central Russia, industrial and residential suburb 12 m. N. of Moscow, with large engineering industry (lorries, underground coaches, laboratory equipment). The Moscow water works (built 1779) are here. Pop. (1956) 91,000 (17,000 in 1926).

**Myton Flags**, series of rocks of Lower Ordovician age, occurring in Shropshire, England. They consist of thick shales or flags made of ashy material, with a few fossils, including trilobites. They are remarkable for their copious supply of zinc, lead, and barytes, and some of the mines were worked by the Romans in Britain.

**Myxoedema**, metabolic disease caused by a decrease in function of the thyroid gland. This gland, which lies in front of the windpipe, is one of the ductless glands. Its function is the secretion of the hormone thyroxin, which speeds up metabolism, growth, and mental activity. If the gland degenerates or is removed by operation a state of sluggish metabolism sets in, with depression of mental function. The body increases in bulk, and the subcutaneous tissue of the face and hands becomes infiltrated with a mucin-like sub-

stance, causing a swelling which does not pit on pressure. The mental processes become sluggish, the speech becomes halting, and there is marked loss of mental and physical energy. One of the characteristic symptoms is a total absence of sweating. M. is more common in women than men. The disease may run its course for many years with gradually increasing intellectual and physical incapacity. The connection of the disease with the loss of activity of the thyroid gland is demonstrated by the similarity of the symptoms to those of operative M., the existence of cases in which the thyroid gland is shown to be atrophied, and the fact that administration of thyroid extract causes a marked improvement.

**Myxogastres**, **Myxomycetes**, or **Myxozoa**, class of widely distributed organisms numbering some 400 species. Some of them were known by the middle of the 19th cent., and were understood to be fungi, but the spores on germination, instead of producing germ tubes, give rise to amoeboid bodies; these have the power of spontaneous movement, and combine in a solid mass or plasmodium or vegetative condition which remains buried in the matrix or host until it creeps to the surface and produces its spores in a position whence the wind will disperse them. Most M. are saprophytes, and some creep over and suffocate seedlings, but a few are parasitic on cultivated plants and trees, causing such destructive diseases as finger-and-toe, corky scab of potato, and crown gall. See FUNGI.

**Myxomatosis**, virus disease of rabbits, first known in 1898 when it almost wiped out the rabbits in a Montevideo laboratory. The symptoms are distinct, with marked swelling of the face and complete lethargy terminating in death. Early attempts to use M. as a method of eliminating rabbits were only partially successful, but one introduction in S.E. Australia spread rapidly, killing four-fifths of the rabbit pop. and, it is estimated, increasing rural production by £50,000,000. In 1952 a Fr. doctor introduced the disease to his estate, but it spread beyond these confines and by 1954 had covered most of France. M. first occurred in Britain in 1953, but whether this was owing to a deliberate or accidental introduction is not known. The disease spread rapidly and this was facilitated by farmers releasing infected rabbits on their own properties. In Australia and France mosquitoes spread the disease, but in Great Britain the rabbit flea is the only likely vector. Although most rabbits are killed those which escape become immune and breed freely; evidence of this is clear in Great Britain at the present time (1958), where, after an initial rapid fall in numbers, the rabbit pop. is steadily increasing again.



# N

**N**, fourteenth letter of the Eng. alphabet, follows **M** in most alphabetic scripts. Also its shape closely followed that of the letter **M** (q.v.). In the **N.** Semitic, the early **Gk.**, **Lat.**, and **Etruscan** alphabets, which were written from right to left, **n** was written **∩**. Gradually it assumed the shape **N**. The **n** minuscule developed slightly later than the **m** minuscule (see **M**). The sound **N** is determined by the position of the tongue against the palate. **N**, in English, standing by itself, is alveolar, and is pronounced with the tongue against the teeth sockets by expelling the breath through the nose. It is palatal or guttural according to the following sound. Thus in *branch* it is a palatal, while before *g* and *k* (e.g. *bank*, *thing*) it is a nasal. **N** and **M** have often been interchanged in the Eng. language. For instance, **N** tends to become **M** finally and when followed by *b*, *p*, or *f*, as in *lime*, *Cambridge hemp*, and *comfort*, from O.E. *linden*, *Cantabrigge*, *haenep*, and late *Lat. confortare* respectively. On the other hand, a medial **N** may be derived from an **M**, as in *ant* (O.F. *amete*, M.E. *amet*, *amel*). **N** is often found in conjunction with **D**, the latter dental being used to clench the sound of the former. Thus **D** is frequently introduced between **N** and **L**, or **N** and **R**, as in *spindle* (O.E. *spinle*), *thunder* (O.E. *donor*). Finally, **D** is sometimes dropped (e.g. *woodvine*, O.E. *wuduwinde*), and sometimes developed (e.g. *sound*, O.E. *sunu*). Initially, through popular etymology or careless pronunciation, **N** has been introduced in *nickname*, *neut*, etc. (O.E. *ēac + nama*, *esle*), and dropped in *orange*, *adder*, *apron*, etc. (M.E. *norange*, *nadder*, *naperon*). See **ALPHABET**.

**Naarden**, tn in the prov. of **N. Holland**, Netherlands, 12 m. SE. of Amsterdam. The old tn, adjoining the IJsselmeer (Zuider Zee), is fortified by wide ditches in a geometrical pattern of the Vauban type, constructed in 1692. Pop. 13,400.

**Naas**, chief tn and administrative centre of co. Kildare, Rep. of Ireland, 20 m. SW. of Dublin. **N.** was the anct seat of the kings of Leinster. The fashionable Punchestown racecourse is 3 m. to the SE. Pop. 3800.

**Naba**, see **NAHA**.

**Nabadwip**, see **NADIA**.

**Nabataei**, or **Nabathae**, an Arab people who occupied the NW. corner of Arabia. They are mentioned in cuneiform inscriptions and in 312 BC defeated a Syrian army. At that time they were nomads. They monopolised the carrying trade and became a strong nation with their cap. at Petra (q.v.). By 100 BC their dominion stretched from Damascus to Medain Salih and down to the Red Sea with the port of Elath. They had difficulties with Rome, but then their king was recognised as a friend of the empire till the state was turned into a Rom. prov. in AD 106.

Certain outlying dists. continued an independent existence till about AD 200 when Palmyra seized what was left of their trade. For their inscriptions the **N.** used Aramaic in a script peculiar to themselves. The best-known god in the pantheon was Dhu-Shara (Dusares), who was identified with Dionysus, numerous dedications to whom in Aramaic and **Gk** have been found in Transjordan. See Jaussen and Savignac, *Mission archéologique en Arabie*, 1909-22, and J. Cantineau, *Le Nabatéen*, 1930-2.

**Nabbes**, Thomas (1605-41), dramatist, b. Worcs. Educ. at Oxford, he began his career as a dramatist about 1630, and his chief plays are *Hannibal* and *Scipio*, 1635, *Covent-Garden*, 1638, and *The Spring's Glory*, 1638, containing his best work. He also wrote a continuation of Knolles's *General Historie of the Turkes*. See works, ed. by A. H. Bullen, in *Old English Plays*, 1887.

**Nabis**, ruler of Sparta (207-192 BC). He usurped the throne and allied himself first with Phillip of Macedon and later with Rome. In 201 BC he took Messene, but was driven out by Philipomenos in 193 BC. Later he ravaged the surrounding ter. and occupied Argos, but was driven out by the Corinthians. He was assassinated by some Aetolians.

**Nabius**, tn of Jordan, 33 m. N. of Jerusalem. It manufs. a special brand of soap containing olive oil. It is peculiar among Palestinian tns in having retained its more recent name in preference to its original name Shechem.

Shechem is associated with the earliest period of Jewish settlement, for here Abraham pitched his tent on entering Palestine, and set up the first altar to Jehovah on a spot still shown on Mt Ebal. It was to Shechem, which lies in the narrow valley separating Mt Ebal from Mt Gerizim, that Joshua led the Israelites after the miraculous passage of the Jordan. **N.** was and is the main centre of the Samaritans. It was captured by the crusaders under Tancred, and an important eccles. council was held here in the reign of Baldwin II. One of the best authenticated holy sites in Palestine is Jacob's Well, which lies just outside the E. end of the tn, below the vil. of Sychar. **N.** itself is long and narrow, and is traversed by 2 parallel *suaqs*, containing sev. mosques, which were formerly crusaders' or Byzantine churches. This part of the tn was severely damaged by earthquake in 1927 but has largely been rebuilt. The Great Mosque in the E. part of the tn was originally a basilica built by Justinian and was rebuilt by the crusaders. Many Jews were murdered here in the Arab revolt of 1929 and **N.** became a strong centre of Arab nationalism. Pop. about 25,000.

**Nabob**, corruption of the Hindūstāni *navab*, originally used only as a title for

native Indian rulers, great officers of the Mogul's court, and governors of provs. The title was also used for the governors-general of the Brit. possessions. In the 18th cent. the title came to be used familiarly for any person who returned from a far country with great riches.

**Nabopolassar** (*Nabu-apal-usur*—'Nabu has guarded the son(ship)'), first King of the Chaldean or Neo-Babylonian dynasty, reigned 626–605 BC. He successfully led the opposition to Assyria while administrator of the 'Sea-lands' and, on being chosen King of Babylon, gradually freed Babylonia of its control. He allied with the Medes to overthrow Nineveh (612) and Assyria and then warred against the Egyptians under Necho II. As an old man he entrusted the army to his son Nebuchadnezzar, who defeated the Egyptians at Carchemish in 605 BC. In Aug. of that year N. d., and his son hastily returned from Palestine to ascend the throne.

**Nabu**, biblical Nebo, Babylonian and Assyrian deity, the god of learning, wisdom and especially of writing, astronomy, and the sciences. His temple (*Ekida*—'The House of Knowledge') was a feature of prin. cities such as Babylon, Borsippa, Nineveh, and Nimrud. His symbol was an upright wedge on a pole, possibly an instrument for sighting the stars. His consort was Tashmetum.

**Nabua**, tn in the prov. of Camarines Sur, Luzon, Philippine Is., 19 m. SE. of Naga. Pop. 42,946.

**Nachtigal**, Gustav (1834–85), Ger. explorer, b. Mielstedt, near Stendal. In 1869 he set out from Tripoli on a mission from the King of Prussia to Bornu, visiting Tibesti and Borku, hitherto unvisited by Europeans, and, by way of Bagirmi, Wadai, and Kordofan, arrived unexpectedly at Khartoum in 1874. In *Sahara und Sudan*, 1879–89, he pub. an account of his travels. In 1882 he was appointed Ger. consul-general at Tunis. His mission to W. Africa in 1884 resulted in the annexation to Germany of Togoland and Cameroon.

**Naerite**, rare unsilicate mineral occurring in 4-sided prisms in metamorphic rocks, both schistose and granitic. It is friable in character, gleaming and pearly, consisting of greenish-white scaly plates, greasy to the touch. It comes under the species kaolinite, and is found in Wicklow in Ireland, and in N. America.

**Naden**, Constance Caroline Woodhill (1858–89), poetess, b. Edgbaston, Birmingham. She was much esteemed by Gladstone for her poems. Her works include *Songs and Sonnets of Springtime*, 1881, and *A Modern Apostle. The Elixir of Life, and other Poems*, 1887. Her complete poetical works were pub. in 1894. See W. R. Hughes, *Constance Naden: a Memoir*, 1890.

**Nadezhdinsk**, see SEROV.

**Nadia**, or **Nabadwip**, tn of W. Bengal, India, formerly situated on the Bhagirathi R., which has since altered its course. It was the bp. of a famous Hindu reformer, Chaitanya (1486–1527), and is a centre of Hindu pilgrimage.

**Nadir Shah Afshar** (**Nadir Quli**) (1688–1747), ruler of Persia, b. Khorasan. He drove out the Afghans from Persia, 1729, and restored Tahmasp II to his throne; N. deposed Tahmasp and became regent for his infant son Abbas III (1732). The latter d. in 1736, and N. was crowned. He is chiefly famous for his invasion of India. He defeated the Moghul army at the battle of Karnal, 1739, and sacked Delhi. See life by L. Lockhart, 1938.

**Nadir** (Arabic *nazir*), astronomical term denoting the point in the heavens which is directly beneath our feet as that directly overhead is called the zenith. In figurative language, the lowest point or lowest stage of depression.

**Næstved**, tn of SE. Zealand, Denmark, 45 m. SW. of Copenhagen. It is an important railway junction, and has large paper mills, textile works, potteries, and iron-works. Pop. 18,880.

**Naevius**, Gnaeus (c. 270–c. 201 BC), Rom. poet and dramatist, b. probably at Capua. He wrote numerous comedies and tragedies, mostly adapted from Gk originals but some on Rom. themes. N. was imprisoned in 206 for his attacks on Scipio and the Metelli; afterwards retired to Utica, where he d. His prin. work was an epic in Saturnian verse on the first Punic war; it influenced Ennius and was admired by Cicero. For surviving fragments see E. H. Warmington, *Remains of Old Latin*, II, Loeb Library, 1936.

**Naevus**, area of pigmentation, or mole; tumour of the skin composed almost entirely of enlarged blood vessels. A vascular N. may diminish in size of itself, in which case no treatment is necessary; or it may show a disposition to enlarge, thus constituting a possible danger through haemorrhage. The N. may be capillary, consisting of enlarged capillaries giving rise to a purplish mark known as 'port-wine stain'; it may be venous, consisting of enlarged veins, giving a bluish appearance; or arterial, when pulsation can be felt.

**Nafa**, see NAHA.

**Nāga**, name given to deified serpents in Hindu mythology; Sesha, the king of the snake world, is the sacred serpent of Vishnu (q.v.).

**Nagapattanam**, see NEGAPATAM.

**Nagar**, see HUNZA AND NAGAR.

**Nagarkot**, see KANGRA.

**Nagas** (*naga*, snake), name of a non-Aryan group of peoples of E. Assam, alleged to be head-hunters, who live between the middle Brahmaputra and the Chindwin. At one time great virtues were ascribed to them. According to Indian mythology the N. are a race of demons descended from Kadin, the wife of the sage, Kasyapa. They have a jewel in their heads, giving them a sparkling appearance, and inhabit one of the 7 beautiful worlds which lie between this world and the hells. Their world is ruled over by 3 chiefs: Sesha, Vasuki, and Takshaka. It is recorded that their daughters often wedded with man (compare the habits of mermaids as exemplified in W. folklore). The old sage, Gauge, one of the fathers of Indian astronomy,

was said to owe all his wisdom to the god *Seaha*. See T. C. Hodson, *The Naga Tribes of Manipur*, 1911, and W. C. Smith, *The Ao Nagas*, 1926.

**Nagasaki**, city of Japan on the is. of Kyushu, at the head of a long bay which forms its natural harbour. It is situated at the W. extremity of the peninsula of Hizen, which forms the NW. portion of the is. of Kyushu. The harbour, one of the most beautiful in the world, is some 6 m. in width, and 3 or 4 m. in length. The hills surrounding the harbour are broken into long ridges and deep valleys, while the more fertile spots are terraced and under cultivation. Before its devastation in 1945, the W. shore was occupied by port facilities, shipbuilding and repair, and the E. shore by smaller shipyards, wharves, and dwellings. The main commercial and residential area of the city lay on the small plain near the head of the bay on its E. shore. From here the valley of the R. Uragami runs N. for sev. miles and a smaller valley branches NE. for 2 m.; the smaller valley was crowded with dwellings, huddled around narrow roads, market streets, and temple squares; the Uragami valley contained large steel, engineering, and armament works, together with smaller factories and a mass of workshops and workers' dwellings. These industries, controlled by the firm of Mitsubishi, plainly dominated Nagasaki, where everything which survived bore the stamp of a vast industrial slum. Early in 1945 some dispersal was begun to workshops set up for the purpose in tunnels and schools, and the latter, built of reinforced concrete, were among the few imposing buildings in Nagasaki. The city did, however, possess a fine complex of modern hospital and medical school buildings. Nagasaki was once a naval base, but its importance declined with the development of the base at Sasebo. In 1940 its pop. was 253,000, having risen slowly since 1930, but it had continued to rise during the Second World War, which gave new importance to its shipbuilding and to its production of torpedoes and other armaments. When the atomic bomb fell (9 Aug. 1945) the pop. was 260,000; 1½ sq. m. of the city were destroyed, and 24,000 people were killed; 30,000 were injured and many of these d. later. The centre of damage wrought by the atomic bomb was in the industrial area between the 2 large Mitsubishi ordnance plants in the Uragami valley. Hence the harbour and the commercial area, 2 m. distant, escaped with minor damage, as also did the housing in the smaller valley screened by the intervening high ridge of hills (for which reasons the area of damage and with it the death roll were smaller than in Hiroshima, q.v.). The few previous attacks on Nagasaki had been aimed at the shipyards, so that most of the damage from them was outside the area of atomic bomb damage; but, as in Hiroshima, the initial blast damage done by the atomic bomb was followed by extensive fires. Nagasaki in 1946 presented the appearance of a city struck by a brief but tremendous hurricane, and the scale of

the disaster brought city life and industry virtually to a standstill.

A 50-ft tower now marks the spot where the bomb fell, and the devastated area, on which are playing-fields, is surrounded by 4000 new dwellings. In the dock area shipbuilding is again active and the residential areas bear little trace of the disaster. There is a plan to rebuild the city as a cultural centre. In 1956 it was extended beyond its pre-war limits, and had a pop. of 304,000. Apart from shipbuilding, it is also noted for its production of machine tools, tinned fish and fruits, and tortoise-shell work.

**Nägeli, Karl Wilhelm von** (1817-91), Swiss botanist, b. Kilchberg near Zürich. After studying botany at Geneva under Candolle he graduated at Zürich Univ., and was ultimately appointed prof.-extraordinary of that institution. In 1852 he was appointed to the chair of botany in the univ. of Freiburg-in-Breisgau, and in 1857 was promoted to Munich, where he remained as prof. until his death. He is famous for having proved, in 1862, by chemical analysis that protoplasm is nitrogenous and differs from other cell constituents. He is one of the fathers of biochemistry. One of his most notable discoveries was that of the antheridia and spermatozooids of ferns and of *Pibularia*. He wrote *Pflanzenphysiologische Untersuchungen* (with Cramer), *Die neuern Algensysteme*, and *Mechanisch-physiologische Theorie der Abstammungslehre*.

**Nagorno-Karabakh Autonomous Oblast**, see MOUNTAINOUS KARABAKH AUTONOMOUS OBLAST.

**Nagoya**, industrial and commercial city of Aichiken, Japan, lying at the head of the shallow Isenoumi Bay some 30 m. from Yokkaichi, 94 m. from Kyoto, and 235 m. from Tokyo. The seat of the prefectural gov., it was the fourth largest city of Japan before the Second World War. It is the hub of railways running NW. and W. to Gifu and beyond, NE. and SE. to Kofu and beyond, and along the coasts of Isenoumi Bay. Its old castle dated back to the early 17th cent., and in modern times it was used as a military depot; but it suffered irreparable damage in the Amer. air-raids. The religious buildings of N. included the Buddhist temple, Higashi Hongwanji. Twelve m. E. of N. is the adjoining city of Seto, famous for its porcelain works first set up here in the 13th cent., and containing the national ceramic experiment centre. N. was especially notable for its silk and cotton fabrics dyed so as to show spots in relief with radiating colours. Cloisonné enamelling in Japan had its beginnings in N. But little of the tn survived the Second World War: some 500 Amer. Superfortresses laid the city waste on 13 May 1945; and it was also hit on other dates. But it was reconstructed with amazing speed, and is again the most important city of central Japan. Its industries include porcelain, plywood, sewing-machines, watches, bicycles, cotton textiles, machine-tools, electric tools, and chemicals. Pop. (1956) 1,336,000.

**Nagpur**, city and cap. of Madhya Pradesh state, India. N. is mainly a city of comparatively recent construction, and the Fort, on the striking Sitabaldi Hill in the centre, dates only from 1818. The early hist. is obscure. As the state cap. N. has many fine public buildings. Politically it has become largely a Maharashtra centre. N. oranges are particularly sweet and juicy and are sold in large quantities to other parts of India.

**Nagy, Imre** (1886-1958), Hungarian politician. At first a Social Democrat, he joined the then illegal Communist party, and broadcast to Hungary from Russia during the Second World War, returning to Hungary with the Soviet Army in 1944. He succeeded Rakosi as premier in 1953, his regime being relatively liberal in character. In April 1955, however, he was dismissed, and subsequently expelled from the Communist party. He was readmitted to the party in Oct. 1956 and later the same month became Prime Minister again, after the outbreak of an anti-Russian revolution. Within 3 days he had recast his gov., dropping 15 Communists from it, and promising the withdrawal of Russian troops from Hungary. It appears that N. aimed at the estab. of an independent Hungary on Socialist but not rigidly Communist lines. Russian military intervention crushed the revolution, however. On 4 Nov. N. was displaced and took refuge in the Yugoslav Embassy. When he left this on guarantees of his personal safety he disappeared, apparently abducted by the Russians to Rumania. In June 1958 it was announced that he had been executed after a secret trial in Hungary.

**Nagyikinda**, see KIKINDA.

**Nagykőrös**, tn of Hungary, in Pest co., 47 mi. SE. of Budapest (q.v.). It is an agric. and wine-producing centre. Pop. 31,000.

**Nagyszeben**, see SIBIU.

**Naha, Naba, Nafa, or Napa**, seaport of Okinawaken, on Great Liukiu Is., Japan. Sugar, cotton, and silks are exported, and there is manuf. of hats similar to the Panama straw. Pop. 65,200.

**Nahuel Huapi, Lake**, lake of S. Argentina, belonging to the same natural system as the Chilean Lakes (Todos Santos, Llanquihué, and others), from which it is not far separated. It has an area of 210 sq. m. and is more than 330 yds deep in some places. It stands 2500 ft above sea level in full view of the peaks of the Cordillera. Mt Tronador commands the scene, and the blue waters of the lake, the mts, and the natural solitude contribute to the charm of a popular tourist area. San Carlos de Bariloche, one of its resorts, is a suitable H.Q. for anglers and others. The region has been a national park since 1934.

**Nahum**, minor prophet, described as an Elkoshite. Tradition narrated by Jerome identifies N.'s vil. with one in Galilee which in Jerome's time was called by the name of Elkesi. The prophecy deals with the fall of Nineveh, which is described with great vigour and majesty. In ch. iii. 8-10 it is said of Nineveh that

she will be as little able to avoid destruction as was Thebes (No-amon), and from this reference one can say certainly that N. prophesied between 664 and 607 B.C. See Davidson, 'Nahum, Habakkuk, and Zephaniah,' in *Cambridge Bible*, 1896.

**Nalads**, see NYMPHS.

**Naidu, Sarojini (Mrs)** (1879-1949), Indian poet, feminist, and governor, b. at Hyderabad, daughter of a Bengali Brahmin educationist and principal of the Nizam's College, Hyderabad. She was educ. at Madras Univ., King's College, London, and Girton College, Cambridge. Her first work, *The Golden Threshold*, 1905, with preface by Arthur Symonds, is western in imagery and sentiment. Her second vol., *The Bird of Time*, with an introduction by Edmund Gosse (1914), also revealed her lyric powers. This was followed by another book of collected poems, entitled *The Broken Wing*, 1917. These too showed her mastery of metrical form, besides earning for her the title of 'the nightingale of India.' But thereafter she became too much engrossed in public affairs, and particularly the feminist movement, to devote her life to literature. She was the first Indian woman to occupy the chair of the National Congress (1925), Mrs Besant being the first woman to do so (1917). Later she toured America and Canada as a Congress propagandist and took part in Gandhi's non-co-operation cult. In 1931 she accompanied Gandhi as the sole representative of the Congress to the second session of the Round Table Conference. She was twice imprisoned for participating in the civil disobedience movement, and again in 1942, with other members of the Congress, for obstruction to the allied cause, being released on grounds of health in 1943. She took a prominent part in the long negotiations which resulted in the setting up of the independent dominions of India and Pakistan, and was appointed governor of the United Provs. For her efforts in relief work in Hyderabad in the floods of 1908 she was awarded the Kaiser-i-Hind gold medal. She did much to break down the barrier of *purdah*, which had so long been strictly observed in that city, and after partition her influence was a major factor in preventing communal riots.

**Nail**. Until a comparatively recent period almost every kind of N. was produced by hand labour: each N., however minute, was separately forged from a thin rod of iron, a process which is still followed in the production of wrought N.s, which possess certain advantages, for particular kinds of work, over those formed either by casting, or by cutting or stamping out of rolled sheet metal. For some purposes N.s formed by the much cheaper process of casting have been long used. Common cast N.s are, however, so clumsy and so brittle that they can only be used for a few coarse purposes as in plasterers' work, and in the nailing up of fruit trees. By the introduction of improvements in the manuf., however, a very useful kind of cast N. has been successfully introduced for certain descriptions of woodwork. It will bear far more bending than

ordinary wrought-iron at the expense of rigidity, such N.s being often nearly as soft as copper, and therefore quite unsuitable for use in hard woods. In the making of cut N.s, the N.s are cut from sheet-iron of suitable thickness, which is first reduced by cutting transversely into strips or ribands of a breadth equal to the intended length of the N.s. *See also* SCREWS, BOLTS, AND NUTS.

**Nail**, measure of land =  $\frac{1}{4}$  yd = 2.25 in.

**Nain, Le, Antoine** (1588-1648), Louis (1593-1648), and Mathieu (1607-77), 3 brothers, Fr. painters, sons of a sergeant, and all b. at Laon and d. in Paris. After being taught the elements of art they went to Paris, where Antoine took pupils in 1629. They were all original members of the Fr. Academy, though little is known about their lives, while their works show no trace of the influences which prevailed when the academy was formed, as, for example, the preoccupation of Fr. taste with mythological allegories or the 'heroic deeds' of the monarch; and as their signature is rarely found and never accompanied by initials differentiation between the brothers is almost impossible. Although they were themselves French, their methods suggest Spain and their subjects Holland. These consist of familiar objects and incidents, such as tavern interiors, card-playing, domestic diversions. The genre pictures are said to have been painted by Louis and Antoine conjointly. Mathieu painted subjects for churches and also portraits—among the latter being Cinq-Mars, Marie de' Medici, Cardinal Mazarin, and Anne of Austria—but none has survived. Room XII of the Louvre is dominated by the brothers, the chief pictures there being 'Boys Playing Cards,' 'The Forge,' 'The Peasants' Noonday Meal,' 'The Watering Place,' and 'The Holy Manger.' In the Florence museum is 'The Adoration of the Shepherds'; in Valenciennes, 'Two Men Playing at Cards'; in Rouen, 'Rustic Interior'; and at Munich a striking picture of a painter at work on a woman's portrait. Their paintings are admirable in realism and in their effective contrasts of light and shade. There are also some fine drawings by the brothers in the Brit. Museum. Champfleury wrote 2 works on the brothers (1850, 1861). *See also* A. Valabregue, *Les Frères Le Nain*, 1904.

**Nain:** 1. Anct tn of Galilee, 26 m. SE. of Acre. Mention is made of this city in Luke vii. 11.

2. Station of the Moravians on the Labrador coast. Pop. 285.

**Naini Tal**, tn of Uttar Pradesh state, India, situated at 5500 ft in the foothills below the Himalayas. It is a popular hot-weather resort and was formerly the summer H.Q. of the then United Provs. There are magnificent views from the neighbourhood of the great snow hills, particularly Nanda Devi (25,645 ft).

**Nainsook** (Hindu *nain*, eye; *sukh*, delight; but the etymology is doubtful), thin muslin-like material of fine texture, with a soft finish, and either plain or striped. It is a kind of jaconet and was formerly made in India.

**Nairn:** 1. Maritime co. of NE. Scotland, bounded on the N. by the Moray Firth, and on its other sides by the cos. of Inverness and Moray. Salmon fishing is an important industry. Agriculture is carried on and there are large granite quarries. The Riv. N. runs through the co. in a beautiful valley, which presents particularly attractive and romantic scenery in the neighbourhood of Cawdor Castle, one of the residences of the Earl of Cawdor. Area 162 sq. m.; pop. 8500.

2. Royal (1124) burgh, and co. tn of N. It lies on the Moray Firth and has a harbour with pier and breakwater. Fishing and agriculture are the main industries. The good bathing and fine golf-courses have made it a favourite summer resort. Pop. 5000.

**Nairne, Carolina Oliphant, Baroness** (1766-1845), song-writer, b. Gask, Perthshire. She was called the 'Flower of Strathearn' on account of her striking beauty. She wrote songs under the pseudonym of 'Mrs Bogan of Bogan' or 'B.B.' The most popular ones are 'The Laird o' Cockpen,' 'Land o' the Leal,' 'Callie-Herrin,' 'Charlie is my Darling,' 'Will ye no come back again,' and numerous Jacobite songs. *See* G. Henderson, *Lady Nairne and her Songs*, 1905.

**Nairobi**, cap. of Kenya Colony and Protectorate (q.v.), and seat of the gov., standing at an altitude of 5453 ft above sea level, 330 m. from the coast. The climate is healthy, and at certain times of the year bracing. As becomes a thriving colony, N. is a city characterised by exhilarating expansion and development. It is the commercial centre of Kenya, surrounded by prosperous farming areas producing coffee, sisal, pyrethrum, dairy produce, and grain. The bulk of the retail trade is in the hands of Indians. The city has frequently been visited by Brit. royalty; social life and amenities are difficult to parallel anywhere in the colonies. N. received its charter as a city from the Duke of Gloucester in Mar. 1950. Pop. (1948) 118,976, of whom 10,830 were European, 41,810 Asian, and 64,910 African. (*See* illustration, p. 38.)

**Naissus**, *see* Niš.

**Naivasha**, tn of Kenya in the prov. of N., close to a lake of the same name, 50 m. from Nairobi. It is the centre of a prosperous European farming area. Lake N. (108 sq. m.) is famous for its flamingoes. White pop. (dist.) 746.

**Najd**, *see* NEJD.

**Nakhichevan':** 1. Autonomous rep. in Soviet Azerbaijan, formed in 1924, situated between the Persian frontier (Aras R.) and Armenia. It is very dry mountainous country with large salt deposits. Area 2100 sq. m.; pop. 129,000, mostly Azerbaijanis, with some Armenians. The chief occupations are irrigated agriculture (cotton, tobacco, grain), horticulture, and sheep raising; salt mining, cotton ginning, silk spinning, and fruit canning. (For hist. *see* AZERBAIJAN.)

2. Cap. and cultural centre of the above. There are food industries, including wine, and salt-mines are near by. The tn con-

tains 12th cent. architectural monuments. According to an Armenian legend it was founded by Noah, whose grave is said to be here; in the Middle Ages it was an important commercial centre. Pop. (1955) 21,000.

3. Nakhichevan-on-Don, former tn founded in 1780 by Armenian colonists from the Crimea, and a lively commercial centre since the early 19th cent. Pop. (c. 1914) 71,000. It has been merged with Rostov-on-Don (q.v.).

Nakskov, port and largest tn on the is. of Lolland, Denmark, 82 m. SW. of

2. Cap. of the above oblast, 50 m. NE. of Kokand, in the Syr-Darya valley. It is a centre for sheep, hides, cotton, and fruit; coal-fields and naphtha beds are in the vicinity. Pop. 90,000.

Namaqua, Hottentot tribe inhabiting Namaqualand, S. Africa. Of all Hottentots they are by far the purest survivors, and are the only tribe to preserve not only the racial type but their own language. Khoi-Khoi is the name by which they call themselves. A dictionary of the N. language was pub. in Tindall in 1852.



E.N.A.

## NAIROBI

Street scene showing Gilfillan House.

Copenhagen. It has the largest sugar refineries in Denmark. Pop. 18,600.

Nakuru, tn of Kenya, cap. of Rift valley prov., attractively situated on the shores of a rapidly diminishing soda lake. It is a centre of the Kenya Farmers' Association, and has a prosperous agric. community who produce wheat, maize, sisal, coffee, and cattle. A branch of the E. African Railways connects N. with Kisumu (134 m.). Pop. (1948 census) 17,625, of whom 1400 were Europeans and 8000 Asians.

Nal'chik, cap., economic and cultural centre of the Kabarda-Balkaz Auton. Rep. (see CIRCASSIANS) in N. Caucasus, 60 m. NW. of Ordzhonikidze. It has varied industry, a university (f. 1957), and is a health resort and tourist base. Pop. (1956) 72,000 (1926, 30,000). N. was founded in 1818 as a Russian fortress (abolished 1863).

Namangan: 1. Oblast (prov.) of the Uzbek S.S.R., in the NE. of the rep., bordering on the Kirgiz S.S.R.

Namaqualand: 1. Great, region of SW. Africa, is a desert land sparsely peopled by Hottentots, lying N. of the Orange R. Angra Pequena, on the coast, affords safe anchorage. The chief activity of the region is the rearing of cattle. Vast quantities of alluvial diamonds are found in N., but the diamondiferous areas are under strict gov. control. In the O'okiep dist. there are large deposits of copper.

2. Little, lies on the NW. of the Cape Prov. and S. of the Orange R. There are copper-mines at O'okiep (q.v.), but the region is barren and is covered with rugged volcanic looking mts. The chief tn is Springbok. The existence of copper in N. was known in the 17th cent., and rich ore was brought to Governor Van der Stel by natives in 1681. The supply has declined in recent years. The gravel beds near the mouth of the Orange R. up to Port Nolloth are diamond-bearing. Gold was discovered on the Richtersveld in 1934. Area 20,835 sq. m.

Namare, see MELK.

**Nam-dinh**, cap. of prov. of same name in Tonking (q.v.). Site of old citadel, and examination centre at which the triennial examinations organised by the Imperial Court were held until early in the 20th cent. There is a Sp. Rom-Catholic mission, founded in the 17th cent. N. has the largest cotton-spinning mills in Viet Nam, which produce cotton yarn, blankets, and miscellaneous cotton goods. Damaged during the 1945-54 war, they have now been taken over by the gov. of the Democratic Rep. of Viet Nam (see VIET NAM, DEMOCRATIC REPUBLIC OF) and have resumed production. No accurate pop. figures are available; there was a very large shift of pop. during 1954-5, and no subsequent census has been taken.

**Name Day**, day which is sacred to the saint whose name is borne by a person. The term is naturally used principally in Rom. Catholic countries.

**Names**, see NAMUR.

**Names** (O.E. *nama*; Ger. *Name*; cf. Lat. *nomen*, Gk *onoma*, title by which a person, place, thing, or class of persons, places, or things is known). **Place N.**, when scientifically studied, furnish information about the early inhab. and the state of their lands, changing modes and conditions of settlement, and alterations of geographical environment. Eng. place N. have much of pure Eng. origin, but there are important Celtic, Scandinavian, Lat., and Fr. elements. They thus embody the hist. of England, its conversion to Christianity, its antiquities and early defence, its institutions and social conditions, meeting-places, industries, and productions. Some riv. and stream names (Avon, Dee, Stour, Thames) are of Celtic origin, as are those of hills and forests (Brent, Malvern, Savernake). The great settlement of Danes which took place in the E. cos. from the end of the 9th cent. onward has led to the place N. of that dist. being largely derived from the Scandinavian. A common place-name termination in the Lines dist. is *-by*, the Norse for a vil. There are a vast number of Saxon place N. in England. Common and obvious suffixes are *-ham*, *-ton*, and *-ing*. Frequently the root of the name is that of the original possessors of the land, sometimes a tribe, sometimes a family, sometimes an individual, as in the case Anlaby (from Anlaf). Rowiston (from Hroif). Rom. place-name influence in Britain was primarily military. The Lat. *castra*, a camp, appears in many forms, either alone or as a suffix (e.g. Chester, Doncaster, Dorchester). Other N. are derived from prominent local features, even from trees, as in the cases of Ashby, Lyndhurst, Aldershot, Olney, and Bromley. The investigation of the original significance of place N. may be extremely difficult, requiring an accurate knowledge of philology; for in the course of ages assimilation, corruption, and popular attempts at etymological correction have often altered the N. almost beyond recognition.

**Personal names** are, in general, more easy to explain than are place N., though their hist. is more complex. Among uncivilised

as well as among civilised peoples the custom obtains of giving each child a name at or soon after its birth, though among uncivilised races the name is sometimes given during the mother's pregnancy. The N. are chosen from nature, from religion, or from some event showing the circumstances of the birth. This method of naming children is well shown in the early books of the O.T. The N. of the gods of the tribe frequently form part of the name. In a later stage of development the name loses its true meaning, and the assignation of the private name of the individual depends on purely arbitrary considerations. By the time of the empire, Rom. N. were already many in number, but 3 of them were of special importance. The first name was purely personal and belonged to the individual. It was known as the *praenomen*. Common Rom. *praenomina* were Gaius, Marcus, Titus, Quintus. Following this came the *nomen* (*gentile*) which belonged to all members of the *gens* and those connected with it or adopted into it. Among patrician *gentes* the *nomen* almost invariably ended in *-ius*. The *cognomen*, or surname, was the family name, and was generally derived from some personal quality or peculiarity, as in the cases of Naso, Torquatus, Lepidus, Longulus, or from geographical considerations, as in Sabinus and Calatinus. Thus, in the case of Gaius Julius Caesar, Gaius is the *praenomen*, Julius the *nomen*, and Caesar the *cognomen*. Of these N. either the first or the last might be used alone, the first 2 or the first and last might be used in combination, but it is interesting to note that the present popular designation, Julius Caesar, is the only one that would never have been used by the Romans themselves. In addition to these 3 N. a fourth was sometimes given, generally in recognition of some great deed or conquest. Thus it was by his exploits against Carthage that Scipio obtained his *agnomen*, or *cognomen secundum*, of Africanus. Similarly we have the additions Asiaticus and Creticus. When a man was adopted into another family he took all the 3 N. of his adopted father, and to these he added a second cognomen derived by the addition of *-anus* to his old *nomen*. Thus, when Gaius Octavius, grandson of Julia, the sister of Julius Caesar, was adopted by his great-uncle, he became known as Gaius Julius Caesar Octavianus. To these N. was added in 27 bc. the honorific title of Augustus.

At the present day, in Christian countries, the child's personal name is known as its Christian or baptismal name, having generally been given on the occasion of its baptism. During the early Middle Ages a man had no name but this. In course of time the necessity for some further distinction arose, and a man was described according to his trade, his residence, his father's name, or some personal peculiarity. The historical novel has familiarised everyone with these various types of surname, and it is not difficult to trace them in Mod. E. The prefix *at* is very common, showing a

place of residence, as in the name Atwood, Atwell, Atfield. Many of the occupations which have provided us with surnames have now ceased to exist. Such are Dempster (judge), Scrivener (writer), Walker (fuller), etc. A very large number of N. are derived from the paternal Christian N., and in each country particular affixes are used. Thus, in England we have the common termination in -son or simply s. In Ireland we have the prefix O' or simply O. in Scotland and Ireland the prefixes Mac and Fitz (Fr. fils), in Wales the form Ap, of which the a frequently disappears (e.g. Price from Apithys). Surnames were very gradually introduced, and it is not until the 12th cent. that they begin to become hereditary. Before and frequently after this time the surname as well as the Christian name was peculiar to the individual. Now, however, it is an established custom that the children should invariably be known by the name of the father. On the occasion of a woman marrying, it is usual for her to take her husband's surname. 'N. of dignity' (i.e. peerage ranks, 'lord' or 'sir') are not accepted by the registrar-general unless right is shown to them. Surnames in Scotland were late in becoming fixed, and owing to the clan system are much fewer than in England. The branches of the clans and houses were distinguished by a third name, which now usually survives in the designation of the chiefs and chieftains of families, e.g. 'Mackintosh of Mackintosh', 'Cameron of Lochiel', and these, where ordinarily used, are legally regarded as part of the surname. Women in Scotland do not lose their maiden name on marriage, but usually assume their husband's—including designation, if any—and are described by both (e.g. 'Mrs Margaret Gordon or MacDonald of Glenbracken') in legal deeds.

**Change of name.** In England N. may be changed by royal licence or by deed poll. The former is conducted by application through the College of Arms, and a deed poll is usually recorded there if the person concerned is entitled to bear arms. In Scotland the Lord Lyon King of Arms has jurisdiction in this matter, and application for royal licence is made through him, but the cheaper course (replacing the deed poll in England) is the Lord Lyon's certificate 'officially recognising' the party under his new name. See *Green's Encyclopedia of the Law of Scotland*, s.v. 'Name and Change of Name' (the only reliable or detailed treatise on the Scots law upon this subject), 1896-1904; C. I. E. Ewen, *A History of Surnames of the British Isles*, 1931; E. Ekwall, *Concise Oxford Dictionary of English Place-names*, 1947; H. G. Stokes, *English Place Names*, 1949; *Oxford Dictionary of English Christian Names*, 1950; A. H. Smith, *English Place Name Elements*, 2 parts, 1956; the co. surveys of the Eng. Place-Name Society.

**Namier, Sir Lewis Bernstein** (1888- ), Brit. historian, educ. at Balliol College, Oxford. From 1931 to 1953 he was prof. of modern hist. at Manchester Univ. The

scope of his studies is very wide, but he is especially distinguished for his research on Hanoverian constitutional hist. which has revolutionised historical thought on this period, and for his writing on modern Europe. Pubs. include *The Structure of Politics at the Accession of George III*, 1929; *England in the Eye of the American Revolution*, 1930; *Europe in Decay*, 1936-1940, 1950; and *Personalities and Powers*, 1955. He was knighted in 1952.

**Namnetes, or Nannetes**, see NANTES.  
**Nampa**, city of Canyon co., SW. Idaho, U.S.A., 20 m. W. of Boise on Boise R. It is the processing and shipping hub of an agric. and dairy area in Boise irrigation project; dairy products, flour, feed, beverages, and beet sugar are produced. It is the site of the Northwest Nazarene College. Pop. 16,185.



D. McLeish

**Namur** (Flem. Namen): 1. Prov. of Belgium, bounded on the N. by Brabant, E. by the provs. of Liège and Luxembourg, W. by Hainaut, and S. by France. The prin. rivs. are the Meuse, which entirely intersects the prov., the Sambre, and the Lesse. To the N. of the valleys of Sambre and Meuse this prov. forms part of the fertile Hesbaye plateau. To the S. it presents an alternation of fruitful valleys and low hilly tracts; but in some parts, where the heights constitute offshoots of the Ardennes, and are densely wooded, they attain an elevation up to about 1650 ft. Besides coal-mines Namur has important quarries of marble, slate, sandstone, and limestone. It has large steel, iron, and smelting works which are concentrated with the industries of glass and chemicals round the city of Namur and in the valley of the Sambre. Anderne (q.v.) is the chief place of the ceramic manufs. in the prov.

The old co. of Namur came in 1188 under Hainaut, and in 1263 under Flanders. In 1421 it was incorporated in



mighty Burgundy. In the 16th and 17th cents. it shared the historical fate of the S. Netherlands. In 1792 it came under France, was united again with Holland in 1815, and eventually became a Belgian prov. in 1830. Area 1413 sq. m.; pop. (1955) 364,125.

2. Cap. of the above prov., situated at the confluence of the Sambre with the Meuse, about 40 m. SE. of Brussels. The city is strongly fortified and is the seat of a bishop. Its most noticeable architectural monuments are the cathedral, rebuilt during 1750-72, the belfry of the 11th cent., and the restored citadel of the 18th cent., at present laid out as a park and containing a forestry museum. Namur is noted for its cutlery, its leather works, and its iron and brass foundries. Porcelain, pottery, glass, cement, chalk, and jam are also manuf. Namur is a very old tn and has many times been bombarded and besieged. It was captured by the Germans in Aug. 1914 and looted. Pop. (1955) 32,100.

The prov. and tn of Namur were under Ger. occupation between 1940 and 1944. The Amer. First Army, pouring across the Senne bridgeheads, began a spectacular drive on a three-corps front towards Namur, Liège, and the Ger. frontier (29 Aug.-4 Sept.). On the right of this front the 7th Corps crossed the Aisne on 29 Aug. and captured Namur and the Meuse crossings near Dinant on 4-5 Sept. (see WESTERN FRONT IN SECOND WORLD WAR).

Nana Sahib (1820-c. 1859). The last Mahratta peshwa, Bajee Rao (Raji Rao II), who was deposed in 1818, and pensioned, adopted Dhondoo Punt (Dandhu Panth), also called N. S. In 1853 Bajee Rao d., and N. S. claimed Bajee Rao's estate and pension, but the latter was refused. On the outbreak of the Indian mutiny (1857) he joined the rebels, and his name is commonly associated with the savagery at Cawnpore (1859), when men, women, and children were massacred. Ultimately he was attacked and took refuge in the jungles at the foot of the Himalaya, where he is supposed to have perished.

Nanaimo, city and coal-mining centre in Vancouver Is., Brit. Columbia, Canada, 74 m. NNW. of Victoria. Chief exports are coal, lumber, salmon, pulp and paper. Pop. 12,570.

Nanohang, cap. of Kiangsi prov., China, situated on the R. Kan, 175 m. SSE. of Hankow. It is a railway junction, and has an extensive porcelain trade. Rice, beans, linen, timber, paper, and tobacco are also traded in considerable bulk. In 1927, when Chiang Kai-shek started his purge of Communists, Chou En-lai, Ho Lung, and others revolted at N., and organised the first Red Army, which became the nucleus of the Chinese Liberation Army. Pop. 412,000.

Nancy, Fr. tn, cap. of the dept of Meurthe-et-Moselle, on the Meurthe and the Marne-Rhine canal. The former cap. of Lorraine (q.v.), N. was taken by France in 1633, was later lost, and finally became French in 1766. The anct part of the tn has narrow, irregular streets, while the modern

part has broad, open streets commanding a view of the surrounding hills. The centre of the tn has what is considered to be one of the finest collections of 18th-cent. buildings in France. N. has a univ. (founded 1572, transferred here 1797), and is the seat of a bishopric. The cathedral was begun in 1703 by J. H. Mansard (q.v.). The tn suffered damage in both world wars. It is an important railway centre, and has iron, salt, and sodium industries. There are numerous manufs., including machinery, textiles, glass, and pottery. Charles the Bold (q.v.) was killed here in 1477, and Isabey, Callot, St-Lambert, and Lyautey (qq.v.) were b. here. Pop. 124,800.

Nanda Devi (the Blessed Goddess), peak of 25,645 ft, one of the most beautiful in the world, situated in a lofty basin in Garhwal almost impossible of access except through the very deep, difficult Rishi Gorge. Longstaff reached the rim of the basin in 1906; further attempts by him and Rutledge and others failed to penetrate to the foot of the mt. E. Shipton and H. W. Tilman did so in 1934, but too late to make the ascent. The expedition of 1936 led by H. W. Tilman, with Graham Brown, Odell, Lloyd, Houston, Loomis, and others, was a triumph of unselfish co-operation, judgment, skill, and determination. Tilman and Odell reached the summit, which at that time was the highest in the world to be climbed. See R. E. Shipton, *Nanda Devi*, 1936, and H. W. Tilman, *The Ascent of Nanda Devi*, 1937.

Nandi, Nilo-Hamitic tribe of Kenya, living in the highlands to the W. of the Rift Valley. Traditionally pastoralists, to-day they are cultivators. They are closely related to the Masai (q.v.) and were great warriors. See G. W. B. Huntingford, *The Nandi of Kenya*, 1953.

Nanga Parbat, mt of Kashmir, W. Himalaya, S. of the Karakorum; height 26,620 ft. The first exploration was made in 1895 by A. F. Mummery, G. Hastings, and Norman Collie, when Mummery and 2 Ghurkhas lost their lives on the Dharma glacier. Six further attempts were all made by Ger. expeditions, and all by way of the Rakhiot glacier and the NE. ridge. The first two were led by Willy Merkl. In 1932 his party found the best route and climbed it to 22,800 ft; in 1934 they climbed to 25,750 ft, but were overtaken by blizzards in which Merkl, Welzenbach, Wieland, and 6 Sherpas lost their lives. The 1937 expedition, led by Karl Wien, was overwhelmed by an ice avalanche at Camp 4 on 15 June. All 16 climbers (7 Germans and 9 Sherpas) were killed. The 1938 expedition, led by Paul Bauer, reached 24,000 ft, when the break of the monsoon forced abandonment of the climb. The 1939 expedition, led by Peter Aufschnaiter, made an unsuccessful reconnaissance of the NW. face from the Dharma glacier. The 1953 expedition was a joint Ger.-Austrian venture organised by Dr Karl Herrligkoffer and led from the rear by Peter Aschenbrener. On 3 July Hermann Buhl reached the summit after climbing 4400 ft alone from Camp 5. He

suffered benightment on the descent. His 40 hours' effort (without oxygen) was no less than heroic. See J. N. Collie, *Climbing on the Himalaya and other Mountain Ranges*, 1902; F. Bechtold, *Deutsche am Nanga Parbat. Der Angriff*, 1934, 1935, and *Nanga Parbat Adventure*, 1935; K. Herrligkoffer, *Nanga Parbat*, 1954.

**Nankauri**, see NICOBAR ISLANDS.

**Nankeen**, cotton cloth of a peculiar yellow shade, which was originally manu. in Nanking (China), but which has been imitated in other countries.

**Nanking**, or **Kiangning**, anct. cap. of China, later the chief tn of the prov. of Kiangsu and the residence of the governors-general of 3 provs. (Kiangsu, Kiangsi, and Anhwei), is situated about 3 m. from the S. bank of the Yangtsekiang and about 100 m. from its mouth. About AD 1000 it was named Kiangnan, but in 1368 it received its present name, which means Southern Capital. The anct. palaces have almost entirely disappeared, and the only remarkable monuments of royalty that now remain are some sepulchral statues of gigantic size near an anct. cemetery, known as the Tomb of the Ming Emperors. N. manufs. satin and crape and the cotton cloth called after the city nankeen. Paper and ink are also produced. It was here that peace was concluded between England and China in 1842. In normal times its imports were chiefly cotton goods and metals, and its exports silk goods, frozen ducks, and skins. In 1909 the railway connecting it with Shanghai (192 m.) was completed, and Pukow on the opposite side of the riv. is the terminus of a line to Tientsin, opened in 1911. This railway caused a large increase in N.'s trade. The neighbourhood is marshy, which makes the climate unpleasant in the hot summer. It is the seat of the National N. Univ. and of many colleges. In 1928 N. was chosen to be the cap. of China in place of Peking. In the Chinese-Jap. conflict it was bombed and attacked by Jap. infantry in 1937. It fell to the Jap. invaders on 18 Dec. 1937. The Japanese in 1940 set up a puppet gov. there, but the Chinese embassies throughout the world formally disavowed it. The city was taken without a fight by the Communists on 23 April 1949, and since then has ceased to be China's cap. See further under CHINA, *History*. Pop. 807,000.

**Nanning**, or **Yungning**, Hsüenchow, cap. of Kwangsi, China, on the railway from China to Viet Nam, an important trading centre. Spices are its chief products. Pop. 240,000.

**Nansen**, **Fridtjof** (1861-1930), Norwegian explorer, scientist, and philanthropist; b. Store Frøen, near Oslo. His first voyage was made in the *Viking*, 1882; his second voyage was made to Greenland in 1888, when he and his companions, Otto Neumann Sverdrup, Capt. O. C. Dietrichson, and others, encountered many hardships in their first crossing of the ice sheet. The most remarkable of Nansen's adventures was his expedition in the *Fram* to the Arctic regions, 1893-6, where he deliberately allowed his vessel to drift with the sea ice as far N. as possible,

and then abandoned his ship to Sverdrup's care in order to push his way by sledge to lat. 86° 13' N. Nansen and Johansen then pushed S. across the ice, wintered in Zenlyya Frantea-Iosifa, and were picked up by the Jackson-Harmsworth expedition in 1896. Before the First World War he investigated sea temps., etc., between Ireland and Iceland, and made further oceanographic research beyond Spitsbergen. In 1917 he represented neutral Norway on a mission to the U.S.A. about food supplies. He was a prin. pillar of the League of Nations from its estab., being chief Norwegian representative. In 1921-3 he was chief inspirer and director of famine-relief work in Russia, working with Hoover. Officially thwarted in his attempt to induce the League to raise an international relief loan, he visited selected tns in N. Europe and raised £250,000 from the public in 6 weeks. He thus ignored official channels, collected a small staff of skilled administrators, and, in conjunction with Hoover and his Americans, fed 10,000,000 starving people. He was also high commissioner of the League of Nations for settlement of refugees, who were mostly White Russians and later on Greeks from Asia Minor. They were without a state or a recognised nationality, and Nansen provided them with a 'Nansen passport,' which was accepted by almost every gov. Lord Rector of St Andrews Univ. in 1926, he refused the premiership of Norway. At the time of his death he was intending to go N. once more - this time by airship. Among Eng. trans. of his writings are *The First Crossing of Greenland*, 1890, *Farthest North*, 1897, *In Northern Mists*, 1911, *Through Siberia*, 1914, and *Armenia and the Near East*, 1928. See lives by W. C. Brogger, 1896; E. S. Stanitt, 1930; J. Sørensen, 1932; E. E. Reynolds, 1932 and 1949; C. Tunney, 1933; Liv Nansen Høyer, 1957.

**Nanshan** (the S. Mts), name of a range of mts in central Asia between Tibet and the Gobi desert. It extends from SE. to NW. at an average height of over 13,000 ft. The whole system, like the Kuenlun, is older than the Tertiary period, and has large carboniferous beds. Marine formations have been found at a height of 18,000 ft above sea level.

**Nanterre** (anct. Nemptodurum, or Nemetodurum), Fr. tn in the dept of Seine, a NW. suburb of Paris, standing at the foot of Mont-Valérien. It has the shrine of St Geneviève (q.v.), patron saint of Paris, who was b. here. There are chemical and metal manufs. Pop. 41,900.

**Nantes** (anct. Nannetes, or Nannetes), seaport city of France, cap. of the dept of Loire-Inférieure, is situated on the r. b. of the Loire, 30 m. from its mouth. The tn contains many splendid buildings and is very picturesquely situated. It is the seat of a bishopric. N. is a busy port, and its industries include boat-building, oil-refining, and tanning, and the manu. of soap, fertilisers, textiles, and metal goods. It has been an important tn in Breton hist. since the days of its commercial prosperity under the Romans.

Here the Edict of N. (q.v.) was signed in 1598 giving religious freedom to the Huguenots. The tn was badly damaged during the Second World War; it was liberated on 10 Aug. 1944, after the U.S. Army's rapid advance into Brittany. Pop. 200,300.

**Nantes, Edict of**, see EDICT OF NANTES.  
**Nanteuil, Robert** (1623-78), Fr. engraver, b. Rheims. Settling in Paris he was appointed in 1658 designer and engraver to the king, with a pension. He ranks as the greatest of Fr. portrait engravers, working from life, modelling the face with great exactness, and using much resource in shading to give texture. Among his finest portraits are those of Mazarin, Pomponne de Bellièvre, Turenne, Jean Loreet, and Anne of Austria. See life by E. Douvy, 1924.

**Nantgarw**, vil. of Glamorgan, Wales, in the Taft valley, 5 m. from Cardiff, giving its name to a hard paste porcelain produced here by Samuel Walker and his father-in-law Wm Billingsley in 1811. With the assistance of Wm Weston Young work continued until 1819 when Young bought the factory. Characteristic decorations were paintings of birds and flowers in bright colours. Pop. 1500.

**Nantua**, Fr. tn, cap. of an arron., in the dept of Ain, on the Nantua lake. It has a 12th-cent. church and a former abbey. There is a silk industry. Pop. 2800.

**Nantucket**, tn and co. seat of N. co., Massachusetts, U.S.A., on the is. of N. (16 sq. m.), 25 m. S. of Cape Cod Peninsula. It is chiefly important as a summer resort, and in the 19th cent. had a large whaling fishery. N. has an interesting hist. from the time of its first settlement by Thomas Macy in 1659. The old name of N. was Sherburne, the present name being given in 1695. Pop. 3400. See A. Starbuck, *History of Nantucket*, 1924.

**Nantwich**, mkt. tn of Cheshire, England, 5 m. SW. of Crewe. An historic tn. N. has long been linked with the important and once thriving salt industry, and it is probable that the Romans came here for supplies from the brine springs. Almost the last stand against the Norman invaders was made at N. by the Earl of Mercia, and Domesday Book records that it was laid waste 'except one salt house.' Earl Hugh Lupus granted the barony of N. to Wm de Malbank, and the tn was renamed Wich (for salt) Malbank. The springs caused jealousy and warfare between Welsh and English; in the reign of Henry VII there were 300 salt works here, but by the reign of Elizabeth I the number was steadily declining. Competition had increased, and in the early 15th and late 16th cents. N. was largely destroyed by fire, and thrice decimated by plague between 1587 and 1604. To-day its extensive recreational facilities have made it an attractive inland health centre. Pop. 9034.

**Nantyglo**, tn of Monmouthshire, England, 7 m. WSW. of Abergavenny. It is part of the dist. of N. and Blaina; N. has rubber and boot industries, while coal is mined at Blaina. Pop. (N. and Blaina) 11,500.

**Naos**, in Gk architecture, the sanctuary of a temple.

**Nap** (card game), see NAPOLEON.

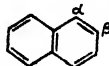
**Napa**, see NAHA.

**Naphtha**, term originally applied to the liquid hydrocarbons in the neighbourhood of the Caspian Sea (the *naphu* of the Assyrians and the naphtha of Dioscorides). The natural oils of other countries became included under the term, which has now been restricted to the mixture of low-boiling hydrocarbons obtained in the fractional distillation of petroleum, coal-tar, and shale oil. The paraffins are petroleum N.s., and olefines and paraffin are obtained from shale oil. Coal-tar N., collected up to 170° C., is a crude light oil which is redistilled fractionally for 'solvent N.' or 'burning N.', which consists of xylene, pseudocumene, etc. All these N.s. are volatile, highly inflammable liquids, with the odour of benzene, and are valued as burning oils and solvents for gums, resins, etc. Wood N. is crude wood-spirit, or methanol (q.v.).

**Naphthadag**, see POSTAGE STAMPS.

**Naphthalene** (C<sub>10</sub>H<sub>8</sub>), aromatic hydrocarbon which occurs in amounts varying from 3 to 10 per cent in high temp. coal tar (q.v.). It is obtained as 'crude drained N.' from the fraction of coal tar distilling between 200° and 230° C., from which it crystallises on cooling. It may be purified by washing with methanol, recrystallising from light creosote, centrifuging and washing with hot water, hot-pressing, fractional distillation or sublimation, or by a suitable combination of these processes. In this way is obtained whizzed N. (melting point, 76-78° C.), phthalic anhydride grade N. (melting point, 78° C. or above), pure N., or sublimed N. (chemically pure N. boils under atmospheric pressure at 217-96° C., melts at 80-27° C., and has a sp. gr. of 1.14 at 20° C. It is insoluble in water, readily soluble in ether, chloroform, or carbon disulphide, and moderately soluble in benzene.

Its main outlet is as a starting material for the production of phthalic anhydride by vapour phase oxidation over a vanadium oxide catalyst. Its more familiar use is as an insect repellent ('moth balls') and deodorant, and it is also an important starting material for the production of dyestuff intermediates. N. has the formula



and undergoes the normal substitution and addition reactions of aromatic hydrocarbons, yielding 2 classes of mono-substituted derivatives called  $\alpha$  or  $\beta$  according to the position of the entering groups. It also forms a characteristic crystalline derivative with picric acid. Only traces of N. or its homologues are found in petroleum oils, but the amount can be materially increased by subjecting these oils to pyrolytic decomposition. The tars formed as by-products in the production of carburetted water gas can contain over 10 per cent of N.

**Naphthionie Acid**, member of the group of naphthylamine-sulphonic acids. It is used in the dye industry, while other members are employed in the synthesis of drugs to combat sleeping sickness and similar trypanosome diseases (e.g. in the drug known as Bayer 205).

**Naphthol** ( $C_{10}H_7OH$ ). The 2 N.s ( $\alpha$  and  $\beta$  or 1- and 2-) are monohydroxy-derivatives of naphthalene corresponding to the monohydric phenols, which they resemble in properties, and are used as dyestuff intermediates;  $\alpha$ -N. (melting point,  $95^\circ$  C.; boiling point,  $282^\circ$  C.) is prepared from  $\alpha$ -naphthylamine, and is a colourless crystalline substance with a faint smell, soluble in alcohol and ether, but sparingly soluble in hot water. The  $\beta$  variety (melting point,  $122^\circ$  C.; boiling point,  $288^\circ$  C.) is slightly soluble in water, its solution giving a green coloration to ferric chloride, while the  $\alpha$  compound gives a violet coloration. It is appreciably soluble in caustic soda and is normally used in this solvent. See DYE.

**Naphthylamine, or Amino-Naphthalene** ( $C_{10}H_7NH_2$ ), occurs in  $\alpha$  and  $\beta$  (or 1- and 2-) modifications;  $\alpha$ -N. is a colourless crystalline substance with a disgusting smell (melting point,  $50^\circ$  C.; boiling point,  $300^\circ$  C.), prepared by reducing  $\alpha$ -nitronaphthalene. The  $\beta$  compound prepared from  $\beta$ -naphthol is odourless (melting point,  $112^\circ$  C.; boiling point,  $288^\circ$  C.). Both varieties and their derivatives were extensively employed in the manuf. of dyes.  $\beta$ -N. is not now used owing to its carcinogenic activity. See DYE.

**Napier, Sir Charles** (1786-1860), admiral, cousin of Sir Charles James N., b. near Falkirk. He entered the navy in 1800, and took part in the operations in the W. Indies in 1800-9. In 1813 he went to America on the expedition up the Potomac, and was put in command of the *Gulabra* off Portugal, 1829. In 1833 he was asked to take command of the Portuguese fleet, with which he was victorious off Cape St Vincent. In the Syrian war of 1840 he stormed Sidon, and in 1854 was commander-in-chief in the Baltic against Russia. He twice sat in Parliament: for Marylebone (1842-6), and for Southwark (1855-60). See Maj.-Gen. E. Napier, *Life and Correspondence of Admiral Sir Charles Napier*, K.C.B., 1862.

**Napier, Sir Charles James** (1782-1853), general and statesman, b. London. He fought in the Irish rebellion, 1798, in Denmark, 1807, and was wounded and taken prisoner at Corunna, 1808. He returned to the Peninsula in 1811, took part in the expedition to Chesapeake, 1813, and after peace was signed became governor of Cephalonia, 1818. In 1841 N. was dispatched to India, and 2 years later won a great victory at Meeanee, by which he subdued the rulers of Sind. His administration was described by his brother, Sir W. P. F. Napier, 1851, who wrote his life, 1857. He himself wrote many books, chief of which were *Colonisation*, 1835, and *Defects, Civil and Military, of the Indian Government*, 1853.

**Napier, Sir Francis**, 9th Baron Napier,

1st Baron Ettrick of Ettrick (1819-98), diplomat, b. Thirlestane, Selkirkshire, and educ. at Trinity College, Cambridge. He began his career, in 1840, at Vienna and Constantinople, afterwards being sent to the U.S.A. and then to The Hague. From 1860 to 1864 he was ambas. at St Petersburg, and from 1864 to 1866 at Berlin. In 1866 he became governor of Madras. After a temporary appointment as Governor-General of India (1872) he returned to England. He was raised to the peerage in 1872.

**Napier, John** (1550-1617), mathematician, the inventor of logarithms, was b. Merchiston Castle, near Edinburgh, and educ. at the univ. of St Andrews and on the Continent. In *Mirifici Logarithmorum Canonis Descriptio*, 1614, he pub. his invention by which sines, tangents, etc., may be briefly calculated. Three years later he wrote *Rabdologiae seu Numerationis per Virgulas libri duo*, describing an ingenious method of multiplying and dividing known as 'N.'s bones,' or 'rods.'

	8	5	7	2	3
1	8	5	7	2	3
2	16	10	14	4	6
3	24	15	21	6	9
4	32	20	28	8	12
5	40	25	35	10	15
6	48	30	42	12	18
7	56	35	49	14	21
8	64	40	56	16	24
9	72	45	63	18	27

NAPIER'S BONES

**Napier's bones.** N. devised a simple system of multiplication by means of rods known as 'N.'s bones.' The way in which they were used is illustrated by the accompanying figure showing the 'bones' arranged for the multiplication of the number 85723. Each of these bones consists of the multiplication table from 1 to 9 for the particular number at its head. The digits are engraved below the diagonal in each square and the tens above it. The strip numbered from 1 to 9 is placed on the left in the position shown. As an example we may multiply 85723 by 5. Beginning at the extreme right of the row opposite 5, we write down the numbers in order, adding the number above the diagonal to the one below the diagonal in the column to the left of it. We thus obtain the answer 428615. In order to multiply 85723 by 7624 (say), the above process is repeated for each number

in the multiplier and the answer is obtained by appropriate addition thus:

342892  
171446  
514338  
600061

653552152

See lives by the Earl of Buchan, 1787, and by M. Napier, 1839, and an article by W. R. Macdonald in the *Dictionary of National Biography*.

**Napier, Sir William Francis Patrick** (1785-1860), soldier and historian, younger brother of Sir Charles James N., b. Colbridge, near Dublin. He joined an Irish regiment in 1800, and subsequently fought in Denmark (1807) and in the Peninsula (1808). His *History of the War in the Peninsula* (6 vols.), 1823-40, is a classic. His other works are *History of the Conquest of Scinde*, 1845, *History of Sir Charles Napier's Administration of Scinde*, 1851, and *The Life and Opinions of General Sir C. J. Napier*, 1857. See life by Lord Aberdare, 1862.

**Napier of Magdala, Robert Cornelius Napier**, 1st Baron (1810-90), Brit. soldier, b. Colombo, Ceylon. He served with distinction through the 2 Sikh wars, was present at the relief of Lucknow, and afterwards defeated Tantia Topi on the plains of Jaora Alipur. In 1868 he was put in command of the Abyssinian expedition, and on account of his brilliant services at the storming of Magdala was created a peer. Subsequently he was appointed commander-in-chief of the forces of India (1870), governor of Gibraltar (1876-82), and constable of the Tower (1886). He was made field-marshal in 1883. See memoir by R. MacLagan; also H. D. Napier, *Field Marshal Lord Napier of Magdala*, 1927.

**Napier**, seaport and winter resort on the E. coast of North Is., New Zealand, on Hawke's Bay, 200 m. N.E. of Wellington by rail. It has a good harbour, Port Ahuriri, protected by a breakwater. Large quantities of wool, meat, pelts, fruit, and canned foods are exported. N., the third largest export port, was badly damaged by the Hunters Bay earthquake, 1931. Large industrial and residential areas are being developed. Pop. 27,492.

**Napier's Bones**, see **NAPIER, JOHN**.

**Naples** (It. *Napoli*): 1. Prov. of Italy, in W. Campania (q.v.). It has a long coastline on the Tyrrhenian Sea (q.v.), including that of the Bay of N. (q.v.). The prov. is generally low-lying, but has a mt range in the S. and other isolated mts (see *Vesuvius*). It is very fertile, and the inhab. are hard-working and frugal. Olives, vines, cereals, hemp, cotton, and chestnuts are produced. The prin. tns include N., Portici, Castellammare di Stabia, Sorrento, and Pozzuoli (qq.v.). Area 452 sq. m.; pop. 2,186,000.

2. (Ger. *Neapel*; anct. *Parthenope*, *Neapolis*) Third city of Italy, cap. of the prov. of N., and chief tn of Campania, 118 m. S.E. of Rome (q.v.). It is famous for the beauty of its situation on the Bay

of N. (q.v.), is a busy seaport, and is the H.Q. of one of the It. naval defence zones. Originally a colony of Cumae (q.v.), N. became allied to Rome in 326 B.C. Under the empire it was a fashionable resort on account of its climate and Gk culture. Virgil (q.v.) composed the *Georgics* here. After the fall of the W. empire the city came under the influence of the Goths (q.v.), but was captured for the Byzantine Empire (q.v.) by Belisarius (q.v.) in 536. It was taken by Totila (q.v.) in 542, and was recovered for the Byzantines by Narses (q.v.) in 553. Later it was an independent duchy, which in 1139 came under Norman rule. Under Charles I (q.v.) of N. and Sicily it became cap. of the kingdom of the Two Sicilies (see *SICILY*). In 1495 Charles VIII (q.v.) of France took N., but was quickly forced to abandon it, and from 1504 until the War of the Sp. Succession (see *SPAIN, History*) it was held by Spain. In 1713 it came into the hands of Austria. In 1734 Charles of Parma (later Charles III (q.v.) of Spain) gained N. and Sicily for the Bourbon family, and estab. himself as King of the Two Sicilies. The Bourbon dynasty lasted until the entry of Garibaldi into N. in 1860, except for two periods: a few months in 1799 when the French created the 'Parthenopean Rep.' (q.v.); and 1806-14 when first Joseph Bonaparte and then Murat (qq.v.) held the kingship. During the Second World War, N., because of its importance as a port and as a railway and industrial centre, was subjected to heavy allied air attack, and great damage was done. By the beginning of Sept. 1943 the city had been practically isolated by the bombing of the key railway junctions surrounding it, and on 9 Sept., the day after the announcement of the It. armistice, the Allies landed at Salerno (see *SALERNO BEACHHEAD*), within striking distance of N. On 22 Sept. the Allies broke through at Nocera Inferiore and took Castellammare, thus opening the way for a drive along the coastal road towards N. and an advance on the right wing northward towards Benevento. On 30 Sept. the road junction of Avellino, on the right, was taken, and on the following day N. fell to the Allies (see *ITALIAN FRONT, SECOND WORLD WAR CAMPAIGNS OF*). Built on volcanic slopes, N. is overlooked by a 14th-16th-cent. fortress on the spur of Sant'Elmo (815 ft); also here is the baroque Certosa di San Martino, which now houses a museum. The main part of the city lies to the E. of the spur, as does the harbour. Near to the harbour is the vast royal palace (17th-19th cents.), the 18th-cent. San Carlo opera-house, and the fine Castel Nuovo, once the seat of the medieval kings and the Sp. viceroys. The archiepiscopal cathedral of San Gennaro (13th-20th cents.) has a neo-Gothic facade; it contains many treasures. There are over 200 other churches, some of them of great interest; many of these were damaged during the Second World War, and works of art contained in them, including paintings by Titian and Caravaggio, were destroyed. N. has a univ.

(1224), a library (housed in the royal palace) which has 1,400,000 vols. and valuable incunabula, and a museum with a magnificent collection of treasures from Herculaneum and Pompeii (qq.v.). The port of N. is one of the most important on the Mediterranean, and has a large passenger and commercial traffic; the prin. exports are wine, fruit, olive-oil, foodstuffs, and building materials. There are shipbuilding, engineering, chemical, textile, glass, paper, and foodstuff industries. Pop. 1,027,800. See C. E. Clements, *Naples, the City of Parthenope, and its Environs*, 1894; A. Norway, *Naples, Past and Present*, 1901; E. Lemonon, *Naples*, 1910; C. Headlam, *The Story of Naples*, 1927; B. Croce, *Storia del Regno di Napoli*,

King of Italy in 1861. See ITALY, History.

**Napo Pastaza**, prov. of E. Ecuador, combined with Santiago Zamora to form the Región Oriental, with an area of 219,095 sq. m. and a pop. of 295,200. The cap. of N. P. is Tena. Balsa wood is produced.

**Napoleon I (Bonaparte)** (1769-1821), emperor of the French, was b. Ajaccio, in Corsica. (For details of his family see the article BONAPARTE.) His father, who had at first supported the Paolists, was now on good terms with the French, and was able to obtain for N. a place at the king's expense in the school at Brienne. Here he was entered as a pupil in 1779. His school days do not seem to have been very happy. He did not show any very



E.N.A.

THE PORT OF NAPLES AND VESUVIUS

1929; H. Belloc, *Naples*, 1932; G. LeFebvre, *Naples*, 1935; B. Molajoli, *Per i Monumenti d'Arte danneggiati dalla Guerra nella Campania* 1944.

**Naples**, Bay of, inlet of the Tyrrhenian Sea (q.v.) in Italy. It is a fine, deep, semicircular sweep of some 50 m. from the Is. of Ischia (q.v.) round to that of Capri (q.v.). The bay is famous for its beauty, has a low promontory in the N., a mountainous one in the S., and is overlooked by Vesuvius (q.v.). The chief tns are Naples, Castellammare, and Sorrento (qq.v.).

**Naples, Kingdom of**, existed from 1138 to 1860. For a time it was ruled by the sovereign of Sicily. In the 16th cent. it became a possession of the kings of Aragon and Spain, having previously been ruled in turns by the Hohenstaufens and the Angevins. In 1713 it passed to Austria under Charles VI. It was ruled by members of the Bourbon family between 1738 and 1806 and again between 1814 and 1860. After the liberation of Italy by Garibaldi it became part of the Sardinian kingdom (1860), which latter kingdom ceased to have a separate existence when Victor Emmanuel was crowned

striking ability, but was proficient in mathematics besides showing steady application to his studies generally. In particular, he spent a good deal of his time in reading hist.

In 1784 he went as a cadet to the military school at Paris, and here he studied with greater zest, since he wished to enter the artillery, and was anxious for the time to come when he would be able to begin rebuilding the family fortunes. In 1785 he was gazetted to a regiment of artillery at Valence, and in Jan. of the following year he commenced his duties as a lieutenant. The death of his father had left him at the head of the family, and during the years which followed the beginning of his military career he spent his furloughs in Corsica. In 1792 he exceeded his leave to support Gen. Paoli. By now he had become an active sympathiser with the revolutionaries in France. In 1793 his break with the Paolists led him to take refuge in France. He left his mother and sisters in Marseilles, but went to Paris himself to find employment. Although by his prolonged absence he had theoretically forfeited his position in the army, the

revolutionary party could not afford to lose its trained officers, and so N. was reinstated and received arrears of pay. He was known, too, to be a good artillery officer and was given the rank of lieutenant-colonel in 1793 and sent to Toulon, which was holding out against the Convention and being supported by an Eng. fleet under Hood. At this time the fortunes of the rep. were at a very low ebb. In addition to wars with hostile external powers, France had also to fight reaction from within. The royalists at Toulon had admitted the English and the Spaniards, and N. was called in to help

year N. married Josephine (q.v.), widow of the Viscount de Beauharnais, who had lost his life during the Reign of Terror; and received the command of the army of Italy (Jan. 1796).

The opening of the It. campaign marks a new era in the hist. of the rep. Hitherto the wars had been fought by the French for what they considered were the principles of the revolution; now all that was to cease, and the armies were given a material incentive in the prospect of spoil and plunder. Thus N. was able to strengthen his position at the cap., to which he sent huge sums of money and priceless gifts which he had exacted, not as plunder, but as the natural spoils of the conqueror. His It. campaign is in many respects his most brilliant. It was noted for his dash and energy and the untiring manner in which all attacks were carried out. Features of the whole campaign were rapidity and accuracy. N. fostered a spirit of revolution in the northern It. states. That spirit was to help him in his campaigns, and later in the war, when, threatened by an overwhelming Austrian army, he was able to depend upon the help of an It. legion. Slowly but surely he drove back the Austrians and Piedmontese. From the neighbourhood of Savona he drove them back across the Adda, and finally, after the victory at Arcola, across the line of the Adige. The Austrians having thus been hopelessly defeated, the northern It. states formed the Cisalpine Rep. During this period N. was the servant of the Directory, but the spoils of Italy gave France and the Directory a new idea of warfare, a warfare that paid for itself and had enough left to supply magnificent presents to the rep.; and in proportion to the plunder so did the favour of N. grow. He was able to a very great extent to act independently of the Directory, to make his own terms, to set up his own forms of gov., to depose and to treat with the princes of the lands conquered.

N., together with his ever-victorious army, now continued his war against the Austrians, driving them back to Leoben, where negotiations for peace were opened. But within France the gov. was again threatened by royalist elements, and the Directory called upon N. for help once more. The Tuilleries were surrounded, the suspected representatives were arrested, the power of the Directory was saved. N. in doing this had strengthened his own position, and had gone one step further towards empire. The Austrians no longer held back, the treaty of Campo Formio was signed, Lombardy was added to the Cisalpine Rep., and Venetia was handed over to Austria. N. could now pursue the plans which he had always had of a campaign in the E.

Almost immediately after the signing of the treaty, N. returned to Paris. So clearly had he shown his power that the Directory was concerned with one thing only, and that was to get him away again as soon as possible. He was placed in command of the army originally intended for the invasion of England, but he



NAPOLEON AS FIRST CONSUL  
Part of Isabey's celebrated portrait.

the besieging forces. Here he laid the foundations of his military reputation. He introduced new methods of artillery attack, and was ultimately mainly responsible for the withdrawal of the hostile fleets and the recapture of the tn. He was made a general of a brigade at the end of 1793, and appointed to the command of the artillery of the army of Italy in the following year. Subsequently he fell into disgrace, was recalled to Paris, arrested, and his name struck off the army roll. But he was soon released.

N.'s chance came with the Parisian insurrection of Sept. 1795. The Paris mob, angered by the work and methods of the Convention, determined to get rid of it. The Convention, liable to be attacked at any moment by the National Guard, entrusted its defence to Barras (q.v.), and he chose as one of his chief subordinates the recently disgraced N. N.'s artillerymen commanded all approaches to the Tuilleries, and their fire swept the streets. N.'s famous 'whiff of grapeshot' really prepared the way for the empire of 1804. The immediate result of the crushing of this rising was the imposition of a new constitution, the First Directory, which was still, however, essentially democratic, but which prepared the way for the ultimate changes which led to the foundation of the empire. In the next

himself had resolved to go to Egypt. Why he was so intent on Egypt does not seem altogether clear, but affords a glimpse of his character, as a visionary of boundless aspiration. The Directory fell in with his plans (May 1798). He just escaped Nelson in the Mediterranean, captured Malta, then in the possession of the Knights of St John, and sailed to Aboukir Bay. He landed his troops and marched against the Mamelukes, whom he defeated. Then came the news of Nelson's crushing victory over the Fr. fleet at the battle of the Nile (1 Aug. 1798) and N. determined to attempt an invasion of

the power into the hands of three consuls, the first consul, N., being the head of the state, with practically all the power, the other two being mere figureheads.

N.'s personal rule meant the end of the factional gov. which had weakened the country during recent years; and his popularity was enormous. He acted swiftly and effectively. The insurrections in the country were immediately put down, and overtures of peace held out to Austria and England; the first impression was to be of a N. aiming at peace for his country, not universal empire. Next he determined upon a campaign which should bring glory to his name, and thus add to the security of his tenure of power. The campaign against the Austrians ended with the battle of Marengo, which the Austrians, after virtually gaining victory, lost owing to the magnificent cavalry charges of Kellerman. Hohenlinden, a victory of Moreau, followed. Then came the treaties of Lunéville (1801) and Amiens (1802), and also the concordat with Rome. Between the election of N. as first consul and his election as first consul for life many of the old civil institutions of France were restored and numerous internal administrative reforms were made, which both increased gov. efficiency and consolidated N.'s hold on affairs. N. had estab. his power in France by virtually dictating peace to the world; now he was to become the sole ruler of France. In Aug. 1802, as a reward for the peace, N. was created first consul for life.

Then, the objects of peace having been accomplished, N. was again anxious for war. His aggressions in Europe soon led to the resumption of hostilities with England, and he thereupon seized Hanover and prepared the way for the policy of aggression which he was about to adopt towards Prussia. In 1804 he declared himself emperor of the French. His gigantic preparations for the invasion of England were finally abandoned after the battle of Trafalgar (1805), but his policy of aggression had made possible another coalition, and having struck his camp at Boulogne, just before Trafalgar, he was soon to shake Europe by his land victories against Austria and Prussia. Violating the neutrality of Prussia, he overwhelmed the Austrians at Ulm and marched into Vienna (1805). The Austrians and Russians, impatient of delay, and not waiting for reinforcements from their Prussian allies, were struck down at Austerlitz (1805). These two blows estab. the empire of N., overthrew the ant. Holy Rom. Empire, and estab. the confederacy of the Rhine under Napoleonic influence. Peace negotiations were broached but failed. Prussia, stung by her contemptuous treatment by N., appealed to arms, but was crushed and disheartened by the terrible blows of Jena and Auerstadt. Again at Eylau (Feb. 1807) and at Friedland, in the same year, he routed the combined Prussians and Russians, and the Tsar Alexander was compelled to sign the peace of Tilsit. Prussia was broken and dismembered. The continental system by which N. sought to conquer Britain



THE EMPRESS JOSEPHINE

Syria—whether he actually contemplated invasion of India, in imitation of Alexander the Great, will never be exactly known—and to return to Europe via the Pers. of the sultan. His campaign in Syria was successful until he reached Acre; this, chiefly owing to Sir Sidney Smith, he failed to take, and he returned to Egypt.

Here news of internal events in France made him decide to go to Paris at once, and in Oct. 1799 he landed in the S. of France, having left his army in Egypt in command of Kléber. The war in Europe was gradually going against the French, the work of the It. campaign of N. had been wellnigh undone by the second coalition, and the Directory was tottering to its fall. N.'s moment had come. The news of his defeats in the Middle E. was not yet known in France, and his journey to Paris was in the nature of a triumphal progress. He was popular and he was fawned upon by all the chief men of the state. Yet for a moment he hesitated, and his actual *coup d'état* might have failed had it not been for his brother Lucien, the president of the Council. He it was who kept the plot in view even when N. had been unnerved, and brought the soldiers to his aid. The Directory was overthrown, and a new constitution gave



was now in full force. He himself was the dictator of Europe, the conqueror of the Hapsburgs, the equal of the ancient line of emperors.

He had reached the height of his power. Thereafter the progress of his decline is to be traced in three facts: first, the attempted annexation of Spain; secondly, the invasion of Russia; thirdly, the rising of the powers of Germany against him. In 1808 he compelled the Sp. king to abdicate and placed his brother Joseph on the Sp. throne. This led to war with Spain, a war in which the national spirit of the Spaniards was aided by the arms of England, and which for the rest of the period occupied a fair proportion of the Fr. troops. The defeat and capitulation of Dupont at Baylen and of Junot at Cintra mark the beginning of the end of N.'s

The allies, with troops numbering 500,000 men, now turned to face N., the morale of whose army was by this time low. The allies held their own, now inflicting a defeat, now sustaining one, until the great contest at Leipzig, which crushed N. and drove him back across the Rhine. The Rhine Confederacy was dissolved. The negotiations for peace which were opened almost immediately after this failed, and the allies invaded France. In spite of a contest full of genius, in spite of many victories, slowly but surely N. was driven back. The Austrians, Russians, and Prussians were all advancing and closing round Paris, while Wellington was gradually approaching the city from the S., having cleared the French from Spain. In these circumstances N. surrendered and, after attempting useless negotiations,



THE RESIDENCE OF NAPOLEON AT ST HELENA

From an old print.

ascendancy. But he was yet to win many remarkable victories. The Austrians were defeated at Ratisbon and then at Wagram, and in 1809 peace was again signed, but the fact that the terms were prejudicial to Russia sowed the seeds of further trouble. In 1810 N., having divorced Josephine who had given him no heir for his empire, married the archduchess Marie Louise of Austria, and a son was born in the following year, to whom the title of King of Rome was given. The economic difficulties caused by N.'s attempt to exclude Brit. goods from Europe still further exasperated Russia, and in 1812 N. decided to invade her. But the N. of the Russian campaign was not the N. of the early days of the cent. His army reached Vilna. He hesitated and then went on. He defeated the Russians at Smolensk; again he hesitated, yet again he went on, and reached Moscow, where he stayed until Oct., the town being in the meantime burned by the Russians. It was then that he resolved to retreat from Moscow, and although the retreat was indeed carried out, five-sixths of the army he had taken with him perished. The next move was a virtual coalition of all nations against N. Russia and Prussia, then most of the Ger. states, and finally Austria were in alliance.

abdicated (1814). He retired to Elba, being given the sovereignty of that is., and the Bourbons, in the person of Louis XVIII, were restored to the throne of France.

But the long wars had left Europe in a very unsettled state, and the name N. still held great appeal in France. Early in 1815 N. escaped from Elba and landed in France. He was enthusiastically received and the Bourbons fled. Europe declared war against him, but only Prussia and England were ready to meet him. N. determined to strike, and to strike quickly, to separate the armies and defeat them in detail. He defeated Blücher at Ligny, but Blücher had a preconcerted plan with Wellington, and while Wellington fell back on Waterloo, Blücher pushed on to come up with him as soon as possible, and Grouchy, dispatched by N. to keep Blücher back, fought only with the rearguard of the Prussian Army. Wellington held the field at Waterloo until the arrival of the Prussians, and the French were swept away in headlong rout. (For a full description of this famous battle see under WATERLOO.) N. then fled to Paris, where for the second time he abdicated. He attempted to escape to the U.S.A., but finding this impossible, on 15 July

he surrendered to Capt. Maitland of the *Hellerophon* at Rochefort. He was sent in Oct. 1815 to St Helena, where he spent the rest of his life in exile, dying there on 5 May 1821 of cancer of the stomach.

The period of N.'s stay in St Helena is one of great interest, for during it were laid the foundations of a Napoleonic legend, on which N. III was to raise himself to the throne. It was, in a sense, N.'s last campaign. The immediate object was a personal one, escape from the Is. by one means or another. The vigilance of Sir Hudson Lowe, who arrived as governor of the Is. in April 1816, thwarted all attempts, and for this reason, amongst others, N.'s bitterness against him was intense.

N.'s intellectual brilliance and military genius are undisputed; but his character was marred by overweening vanity; he had nothing but contempt for the ordinary citizen on whom he ultimately relied for the fulfilment of all his ambitions. He was at heart a cynic—cynical of mankind, cynical of religion—and his ruthlessness extended to the most personal details of his life.

His career ultimately weakened France: yet even in modern times it is his military glories and administrative reforms which are most remembered, and the final defeats and the resultant chaos tend to be pushed into the background. Even during his lifetime, while he was dying in St Helena, the Napoleonic legend took root and flourished. It was to weaken France for the next half-cent.; for many whom the reaction of the restoration antagonised, many who felt dissatisfied with the bourgeois monarchy of Louis Philippe, turned to the mirage of N, the liberator, and gave their support to his nephew, Louis N. (N. III), who was clear-sighted enough to see its tremendous value and to adopt the legend himself. Before him it had influenced the young Duke of Reichstadt, son of N. and Marie Louise, passing his adolescent years in the Austrian court. The exalted view of his father which he gained from N.'s memoirs fired his ambition to return to the throne of France. During his short life there were endless Bonapartist conspiracies centred around his person, and Metternich considered him, with justification, a standing menace to European peace. See B. E. O'Meara, *Napoleon in Exile*, 1822; J. G. Lockhart, *Napoleon Buonaparte*, 1829; Lord Rosebery, *Napoleon, the Last Phase* (from deportation to death), 1901; H. A. L. Fisher, *Studies in Napoleonic Statesmanship: Germany*, 1903, and *Napoleon I*, 1924; A. Fournier, *Napoleon I* (Eng. trans.), 1904; A. Vandal, *L'Avènement de Bonaparte*, 1912; R. B. Mowat, *Diplomacy of Napoleon*, 1924; H. Butterfield, *The Peace Tactics of Napoleon, 1806-8*, 1929, and *Napoleon*, 1939; H. S. Wilkinson, *The Rise of General Bonaparte* (early military career), 1930; F. von Funk, *In the Wake of Napoleon*, 1931; J. Dechamps, *Sur la légende de Napoléon*, 1931; F. M. Kirchoff, *Napoleon* (Eng. trans.), 1931; J. Bainville, *Napoleon* (Eng.

trans.), 1932; B. H. Liddell Hart, *The Ghost of Napoleon* (strategy), 1933; A. G. Macdonell, *Napoleon and his Marshals*, 1933; J. Holland Rose, *Napoleon I*, 1934; P. Guedalla, *The Hundred Days*, 1934; O. Aubry, *St Hélène*, 1935 (Eng. trans., 1937); L. Villal, *La Révolution et l'Empire*, 1936; E. Tarlé, *Bonaparte* (Eng. trans.), 1937; R. Price, *The Riddle of Napoleon*, 1937; L. Madelin, *Consulate and Empire*, 1937-8; J. Dormer Creston, *In Search of Two Characters*, 1945, 1947; H. Cottard, *Structure du génie de Napoléon I<sup>er</sup>*, 1946; S. de Chair (ed.), *Napoleon's Memoirs*, 1948; P. Geyl, *Napoleon: For and Against*, 1949; E. Ludwig, *Napoleon* (Eng. trans.), 1950; J. M. Thompson, *Napoleon Bonaparte: His Rise and Fall*, 1951; P. F. Langle, *Napoleon at St Helena*, 1953; J. Hale, *Napoleon: The Story of his Life*, 1954; J. M. Thompson, *Napoleon's Letters* (new ed.), 1954; J. C. Herold (ed.), *The Mind of Napoleon*, 1955; Stendhal, *A Life of Napoleon* (Eng. trans.), 1956.

Napoleon II (1811-32), son of N. I by his marriage with Marie Louise of Austria, b. Paris. His father created him King of Rome. N. I abdicated in his favour, 1814, but no attempt was made to establish his claims, and he was educ. in Austria. The Austrian emperor made him Duke of Reichstadt in 1818. Always delicate in health, he was kept under constant watch by the Austrian authorities because of his position as N.'s heir (he was known as N. II by the imperialists, although he never reigned and was never crowned). His life was lonely and frustrated: his mother showed no interest in him after 1814 until he lay dying, and he was the centre of numerous abortive imperialist plots. Rostand's *L'Aiglon*, 1900, is a dramatised and romanticised version of his life. See also F. Masson, *Napoleon et son fils*, 1922, and Dormer Creston, *In Search of Two Characters*, 1945, 1947.

Napoleon III (Charles Louis Napoleon Bonaparte), generally known, before his assumption of imperial status, as Louis Napoleon (1808-73), Emperor of the French, third son of Louis Bonaparte (brother of N. I), b. Paris. His mother was Hortense Beauharnais, the step-daughter of the emperor. He was brought up principally in Switzerland. In 1832, by the death of the first N.'s only son, the Duke of Reichstadt, he became the head of the family, both his elder brothers being now dead. During the next few years he pub. a good deal of literature, dealing principally with his political ideas and fostering the Napoleonic legend. During the reign of Louis Philippe, taking advantage of the disturbed state of France, he made two attempts to seize power. The first, in 1836, was easily repressed, and he was deported to America; the second, in 1840, when he landed at Boulogne from Britain, ended in his being condemned to life imprisonment in Ham fortress. There he continued his writings, and added to his already large output of Bonapartist literature. After just over five years' imprisonment he managed to escape, and returned to London. By this time the pamphlets he had written were

bearing fruit: his supporters in France were now very numerous. Taking advantage of the revolution of 1848 he hurried back to France, where he had been elected as a deputy in the Constituent Assembly. Having taken his seat, he almost immediately resigned, but was again elected for five different constituencies. Encouraged by this, he determined to stand as a candidate for the presidency, and was elected by a majority of five to one over his opponent, Cavaignac. Although N. had taken the oath of allegiance to the rep., he soon showed his true intentions. He rapidly assumed the control of the army, practically every post of importance was given to his own nominees, and finally, in Dec. 1851, he dissolved the Assembly by force and brought about his famous *coup d'état*. His popularity was now enormous. He was first elected president for 10 years; and then, Dec. 1852, assumed the title of emperor. Posing as the candidate and representative of the people, and personally highly cultured and humane, his inept handling of national and international policies soon forced him to develop into a despot, who gagged the press and repressed personal liberty. In 1853 he married the Countess Eugénie de Montijo (see *ETIENNE*).

His foreign policy occasionally showed strokes of brilliance. For example, his allegedly benevolent interference in It. affairs led to the annexation of Nice and Savoy by France; but his attempt to impose a monarch on the Mexicans led to a tragedy which dealt a permanently damaging blow to his personal reputation. By 1865 it became apparent that his influence was on the wane. At home the extravagance and decadence of the court caused bitter anger among a working-class now beginning to feel acutely the economic burdens of the new industrial age. N. turned to a more liberal policy, but it was too late. In 1870, becoming aware that his main support, the army, was beginning to fall away in its allegiance, he made a last attempt to rally it. He interfered in the question of the Sp. succession, for which a prince of the house of Hohenzollern was a candidate, and although the Prussians withdrew their prince, events led on to declaration of war. N. was completely unaware of the feeble state of his army. When he declared war he was firmly convinced that the French would easily gain Berlin, but 300,000 Frenchmen were opposed by 500,000 Prussians, and N. never crossed the Rhine. He was crushed at Saarbrücken, at Weissenburg, and at Metz, and finally came the crowning defeat at Sedan. On 2 Sept., the day after the battle, N. surrendered to the Prussian king, and was kept a prisoner until the end of the war. In the meantime his wife had retired to Chislehurst in Kent, where in 1871 she was joined by N., who d. there nearly two years later.

N. possessed intelligence and ability: a highly successful intriguer (as events up to 1852 show), he lacked consistent powers of statesmanship. His fundamental intolerance and indecisiveness generally pre-

vented his better conceived plans from reaching fruition: he was, in the last resort, driven to opportunism, and lacked the nerve or drive to sustain a policy on this basis. His most influential pubs. were *Réveries politiques*, 1832, and *Idees napoléoniennes*, 1839. See H. A. L. Fisher, *Bonapartism*, 1908; F. A. Simpson, *The Rise of Louis Napoleon*, 1909, and *Louis Napoleon and the Recovery of France*, 1923; O. Aubry, *Le Second Empire* (with bibliography), 1938; A. Guérard, *Napoleon III*, 1946; F. C. Palm, *England and Napoleon III*, 1949; J. M. Thompson, *Louis Napoleon and the Second Empire*, 1954.

Napoleon, Eugène Louis (1856-79), only see BONAPARTE, Lucien Bonaparte.

Napoleon, Prince Lucien (1775-1840), see BONAPARTE, LUCIEN BONAPARTE.

Napoleon, obsolete Fr. gold coin of the value of 20 francs (nominally 15s. 10d. Eng. money), with a portrait of Napoleon stamped on it.

Napoleon, or more commonly 'Nap,' a card game. Probably the element of chance easily predominates over the skill required, for which reason the game may well be included under the category of gambling contests. The ordinary form of the game consists in dealing 5 cards to each of a number of players (as many as 10 can play), the object being to make as many tricks as possible, each playing against each, or only combining for the sake of defeating the player who has obtained the lead by making the highest call. The first card the latter plays decides trumps. Tricks are made by putting down the highest card in each round, it being imperative to follow suit if possible; if not the player may, if he can, trump the led suit. There is nothing very complicated in the game. Betting is usually level money all round, at some agreed sum per trick, very often a penny or halfpenny—hence the term 'penny nap.' Generally, if a player wins after 'going nap,' i.e. calling all 5 tricks, the other players pay him 10 counters or pennies, or other unit adopted, i.e. double stakes. If he loses, however, he forfeits only 5, probably as a consolation for a bold risk. There are variations of the game, one of the most popular being 'Misery.' Here there may or may not be trumps according to arrangements among the players, but as a rule there are no trumps. The *misère* hand is that held by the player who undertakes to *lose* all 5 tricks, the remaining players of course endeavouring to force tricks upon him.

Napoléon-Vendée, see ROCHE-SUR-YON, LA.

Napoleona Imperialis, see BELVISIA.

Napoléonville, see PONTIVY.

Napoli, see NAPLES.

Nara, anc. city of Naraken, Japan. It was the cap. of Japan from AD 710 to 784, one of the golden ages of Jap. hist. The city contains numerous temples, shrines, and other works of art; round about are the remains of the previous era. The most famous buildings in N. are the Todaiji temple (743), Shosoin Imperial Storehouse (756), Kasuga shrine (c. 709),

Shin Yakushiji temple (747), Toshodaiji temple (759), Yakushiji temple (698), and Kofukuji temple (c. 710). In the suburbs is Horyuji temple (607), the oldest surviving building in Japan and the oldest wooden building in the world. N. has a small cotton industry, but its income is derived mostly from tourists. Pop. 119,000.

**Naracoorte**, business centre of rich pastoral and dairying dist., 239 m. SE. of Adelaide, S. Australia. N. is a railway junction on Adelaide-Mt Gambier and N.-Kingston lines. N. caves, 7 m. from the tn. are a well-known tourist attraction, consisting of a group of deep limestone caverns with stalactite and stalagmite formations. N. has a large dist. hospital. Pop. 3000.

**Narasinha**, in Hindu mythology the fourth *avatar* of Vishnu, the reincarnation of the god in the form of man in order to put to death Hiranya-Kasipaa, King of the Daityas, who was oppressing mankind.

**Narbada**, or **Nerbudda**, riv. of India, rising in Madhya Pradesh state, flowing in a generally WSW. direction till it falls into the Gulf of Cambay, 28 m. W. of Broach. Length 750 m. Navigation is impeded by rocks and shallows.

**Narbo Martius**, see **NARBONNE**.

**Narbonne** (Rom. **Narbo Martius**), Fr. tn cap. of an arron., in the dept of Aude. It was the cap. of Provincia (see **PROVENCE**), and was taken by the Visigoths (see *under* **GOTHs**), the Franks, and the Saracens (q.v.). Once a port, its harbour has now disappeared. It was an archbishopric from the 4th to the 18th cents., but its notable 13th-cent. cathedral has never been completed. There are many other fine buildings. It was the bp. of the Rom. emperors Carus, Carinus, and Numerianus (q.v.). It is known for its wines and honey, and has distilleries and potteries. Pop. 30,000. See R. Rey, *L'Art gothique du Midi de la France*, 1934.

**Narbrough**, or **Narborough**, Sir John (1640-88), admiral, b. Norfolk. In 1670 he conducted an expedition through the Straits of Magellan. In 1674 he commanded another expedition to the Mediterranean, and was successful in destroying sev. Algerian and Tripolitan pirate ships. His last expedition was that to the W. Indies in 1687, and while superintending the recovery of a treasure ship (off St Domingo) he was attacked by fever and d.

**Narceia**, or **Narceine** ( $C_{25}H_{37}O_5N$ ), narcotic poison prepared from opium (q.v.) bases. It is the most powerful narcotic of all the opium alkaloids. Practically insoluble in cold water, soluble in alcohol and hot water, insoluble in ether. Yields narcotic acid in oxidation with potassium permanganate. It is decomposed by the stronger and concentrated acids. It is formed from narcotine (q.v.) by treating the methiodide with aqueous caustic soda.

**Narcissus**, Gk youth famous for his beauty. He was beloved by many, including the nymph Echo (q.v.), but rejecting all their advances was punished by the gods, who made him pine away for love of his own image, reflected in a pool. He was changed into the flower which

bears his name. **Narcissism**, a term used by psycho-analysts, means excessive love and admiration of oneself.

**Narcissus**, family **Amaryllidaceae**, a genus of hardy bulbous plants of Europe, N. Africa, and W. Asia, much cultivated for their beautiful flowers, which are usually white or yellow, with tubular perianth and spreading segments, and a conspicuous corona, with 6 stamens growing from the tube, and inferior ovary; leaves are linear. Varieties are numerous, and horticulturally N. are divided into 11 divs.: 1. Trumpet N.; 2. Large-cupped N.; 3. Small-cupped N.; 4. Double N.; 5. Triandrus N.; 6. Cyclamineus N.; 7. Jonquilla N.; 8. Tazetta N.; 9. Poeticus N.; 10. Species, wild forms, and hybrids; 11. Miscellaneous N., not in the foregoing divs. *N. pseudo-narcissus* is native to Britain, but variable. Garden culture consists of planting the bulbs as early as possible, in well-drained loam, setting about twice their diameter in depth in the soil, with a little bonemeal, but no animal manure. Many N. can be forced, especially if subjected to a pre-cooling treatment to give earliness.

**Narcissus** Fly, or *Merodon equestris*, dipterous fly, giving rise to larvae which do very serious damage to N. bulbs. It appears between May and July, and lays its eggs between the leaves and on the ground. The fly is somewhat like a bee, about  $\frac{1}{2}$  in. long and with variable stripes of red, yellow, or white, and with a black band across the thorax, but is distinguished by its two-winged character and the absence of the long black antennae found in all bees. The flies are best caught with a net when they settle for egg-laying, or can be trapped with saucers of treacle or honey. Newly bought bulbs should be carefully examined so that all infested bulbs can be lifted and destroyed. The occurrence of the pest must be notified to the Ministry of Agriculture.

**Narcotic Poisons**, see **POISONS**.

**Narcotics**, drugs which produce stupor if the dose is increased beyond a certain limit. The most important narcotic is opium. The opium alkaloids, alcohol, belladonna, henbane, Indian hemp, and chloral, all have a primary stimulating effect, but are poisonous in excess. Owing to their power of inducing sleep, some are called hypnotics (q.v.) or soporifics (e.g. sulphonal), while others which alleviate pain are called anodynes (e.g. antipyrin).

**Narcotine**, alkaloid occurring in opium (q.v.). The other important alkaloids in opium are morphine (see **MORPHIA**), papaverine, codeine, and thebaine.

**Narcolepsy**, see **ACETYLENE**.

**Nardi, Jacopo** (1476-1563), It. historian, b. Florence. In 1527 he was sent as an ambas. to Venice. His work entitled *Storia della Città di Firenze dell' anno 1494-1631*, pub. in 1582 (and a second ed. in 1584), forms a sequel to that of Machiavelli.

**Nardo**, It. tn in Apulia (q.v.), 14 m. SSW. of Lecce (q.v.). It has a 15th-cent. cathedral, and there are textile manufs. Pop. (com.) 26,000.

**Nardostachys**, or **Nard**, family Valerianaceae, genus of Indian perennial herbs, of which *N. italicus* has basal, long leaves and rose-purple flowers in very dense cymes in terminal panicles. The rootstock is thick, short, and very fragrant, and the source of spikenard, the aromatic unguent of the ancients; also used in medicine. The plant is hardy for Brit. gardens.

**Narenta**, see **NERETVA**.

**Nares**, Sir George Strong (1831-1915), Scottish admiral and explorer, b. Aberdeen. In 1852 he was a member of Sir Edward Belcher's expedition in search of Sir John Franklin. In 1867 he was captain of H.M.S. *Challenger*, the first steamship to cross the Antarctic Circle. From dredging operations it was inferred that there was a continent in the far S. From 1875 to 1876 Nares led a Brit. naval expedition in H.M.S. *Alert* and *Discovery* to the polar basin. The *Alert* wintered off N. Ellesmere Is., having met impenetrable ice in lat. 82° 27' N. in Robeson Channel. Sir A. H. Markham and A. C. C. Parr led a sledge party from the ship to lat. 83° 20' N. Nares wintered in the *Discovery* at lat. 81° 44' N. Nares did valuable hydrographical work on Mediterranean currents and on the equatorial current, and received the founder's medal of the Royal Geographical Society, 1877, and the gold medal of the Geographical Society, Paris, 1874. He pub. sev. works on his explorations. See his *Narrative of a Voyage to the Polar Sea during 1875-6*, 1878, and A. H. Markham, *The Great Frozen Sea*, 1894.

**Narev**, **Battles of the**, fought in 1915, the riv. forming the line of the Russian defence of Warsaw against Hindenburg's advance. The fighting extended over the period June-Aug., Warsaw falling in Aug. 1915. See also **WORLD WAR, FIRST**.

**Nariño**, dept of SW. Colombia, with the Pacific Ocean to the W. and Ecuador to the S. Stock-raising is important, gold is mined, and cereals, cocoa, rice, potatoes, and sugar are grown. There are manufs. of footwear and Panama hats, which latter are exported from Tumaco. There is a univ. at Pasto, the cap. Area 11,540 sq. m.; pop. 599,680.

**Narni**, It. tn. in Umbria (q.v.), in the Nera valley, 7 m. SW. of Terni (q.v.). It has a cathedral (partly 12th cent.), a 14th-cent. castle, and a 13th-cent. tn hall. There are Rom. remains near by, and mineral springs. The tn is surrounded by olive groves. Pop. (tn) 6300; (com.) 21,100.

**Naro**, see **NERETVA**.

**Narocz**, **Battle of Lake**. Lake N. is in Lithuania, situated about 60-70 m. NE. of Vilna. In the autumn of 1915 the Germans and Austrians forced back the Russians along the whole of the E. front, and in the region of the lake the line ran practically due N. and S. To relieve the pressure of the Germans on the W. front, who were then making some progress at Verdun (q.v.), it was arranged to create a diversion on the E. front, and an advance in this region was designed. All available Russian resources were duly concentrated

and the battle opened at dawn on 18 Mar. Once the Germans had recovered from their surprise they resisted every Russian advance. The battle eventually petered out about 27 Mar., owing to the exhaustion of the Russians.

**Narragansett Bay**, inlet on the SE. of Rhode Is., U.S.A. It is 30 m. long and 3 to 12 m. wide. It encloses a number of is., the largest of which is Rhode Is. See **RHODE ISLAND**.

**Narragansett Pier**, summer resort, 9 m. W. of Newport, Rhode Is., U.S.A.

**Narrandera**, tn on Murrumbidgee R., in New S. Wales, Australia, 360 m. SE. of Sydney. It is in the centre of the rich agric. and pastoral div. of the Riverina. Pop. 4540.

**Narrows**, The, very short strait, about 3 m. long, 1 m. wide, 8 m. S. of New York, between Brooklyn on the E. and Staten Is. on the W. It forms one of the prin. entrances to New York harbour.

**NarSES** (c. 472-568), Byzantine general and statesman. He was an Armenian by birth, and a eunuch. In 538 he was sent to Italy to act with Belisarius (q.v.) against the Goths. He quarrelled with the general and was recalled in 539, but on the recall of Belisarius, N. was reappointed to the command in Italy, and at a fierce engagement at Tagina defeated the Goths, and killed their king, Totila. In 553 he defeated Teja at Sarno (q.v.) and took Rome. He was made exarch of Italy, fixed his court at Ravenna, and, until the death of Justinian in 565, administered the affairs of Italy with ability and vigour. At the accession of Justin he was accused of extortion and dismissed. After this he was accused of intriguing with Alboin, King of the Lombards, for a new invasion of Italy, but his participation was never proved, as he d. at Rome in 568 before the Lombard invasion. See also **GOTHS** and **JUSTINIANUS**.

**Narthex**, in architecture, the W. porch of an early Christian basilican church; for the use of women, penitents, and others who were not allowed to enter the church itself.

**Narva**, seaport in Estonia, half way along the Tallinn-Leningrad railway. It has a large textile industry (since the 19th cent.), and a big hydro-electric station is under construction. There are many architectural monuments of the 14th-19th cents. Founded by the Danes in 1223, it became Livonian in 1347, Swedish in 1581, and Russian in 1704. It has been an important commercial centre since the 14th cent. The Russians were defeated here by Charles XII of Sweden in 1700. N. was occupied by the Germans in 1918 and 1941-4. Pop. (1956) 21,000.

**Narvaez**, Pánfilo de (c. 1480-1528), Sp. soldier, b. Valladolid. He went to America, and from 1512 was under Velázquez in command of an auxiliary force in the conquest of Cuba. In 1520 he was sent to supersede and punish Cortés, but was defeated at Cempoalla and deserted by his army. Having returned to Spain he was appointed governor of Florida in 1526, but was drowned in 1528.

**Narvaez**, Ramón María, Duke of

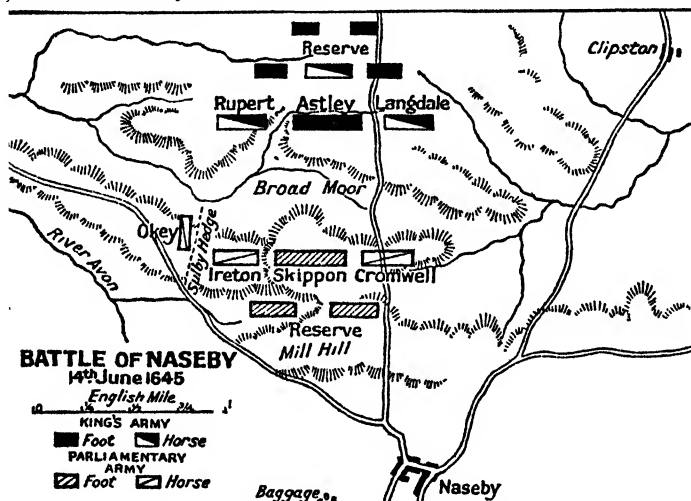
**Valencia** (1800-68), Sp. general and statesman, b. Loja, Granada. N. entered the army in 1815, and later served against the Carlists. He opposed Espartero, and was forced to flee to France c. 1839, where he was afterwards joined by Queen Christina. He started a revolution in her favour and entered Madrid, 1843; the same year he declared the majority of Isabella II and became lieutenant-general of Spain. He was created duke and Prime Minister, 1844-6; ambas. at Paris, 1847; head of the ministry, 1847-51, 1856-7, and 1864-5.

**Narvik**, seaport of Nordland co., Norway, on the Ofoten Fjord. N. owes its

animal is from 10 to 16 ft long. It has a grey back, mottled with black, the under parts being much lighter, but also spotted. It has a blunt short head, no dorsal fin and very small flippers, but is very active and a rapid swimmer. It is peculiar to the Arctic Ocean, though it occasionally strays as far S. as Brit. seas. The oil is valuable and the flesh edible.

**Naryn-Mar**, tn and seaport in the Archangel oblast of N. Russia, cap. of the Nenets (q.v.) National Dist., on the R. Pechora. Pop. (1956) 11,000, mostly Russian.

**Narym**, swampy forested area in the N. of Tomsk oblast (W. Siberia), traversed



THE BATTLE OF NASEBY, 14 JUNE 1645

rise to the construction of the Ofoten railway, completed in 1903, and is the port for the shipping of iron ore. On 13 April 1940 a Brit. flotilla forced its way into N. Fjord and sank 4 Ger. destroyers. A combined force made up of Norwegians, Poles, French, and British made a strong attack on the Ger. garrison at N., which was captured on 28 May, but on 10 June the allied forces left. N. was destroyed but was rebuilt after the Second World War. New quays can take ships of up to 25,000 tons. In 1955 9 million tons of iron ore were shipped from N. Pop. 11,000. See also NAVAL OPERATIONS IN SECOND WORLD WAR AND NORWAY AND DENMARK, GERMAN INVASION OF (1940).

**Narwhal**, or Sea Unicorn (*Monodon monoceros*), cetacean, allied to the dolphins and porpoises. The male has one, almost invariably the left, of the teeth or tusks in the upper jaw extraordinarily developed into a spirally furrowed horn of pure ivory from 6 to 10 ft long. This is the longest tooth found in the Mammalia. The adult

by the Ob'. It covers about 100,000 sq. m. Pop. (1935) 145,000, mostly Russians, engaged in lumbering, hunting, and fishing. It has been an area of banishment since the 1860's.

**Nascent State**. Gases in the free state usually consist of molecules containing 2 or more atoms. These atoms are held together by a force of attraction which, in general, must be overcome before chemical action can be effected. Therefore gases that have just been liberated from combination, before the atoms have had time to combine into molecules, are more active chemically than after combination into molecules. Chemists use the term 'nascent state' to describe the condition of substances which so act at the instant of their liberation from combination. Ordinary nitrogen will not unite with hydrogen, but if a solution of a compound of nitrogen is poured into a flask in which hydrogen is being generated, ammonia will be formed. The peculiar behaviour of 'nascent' gases varies according to the reactions in which they are

formed, and thus is not solely due to their being in the atomic state.

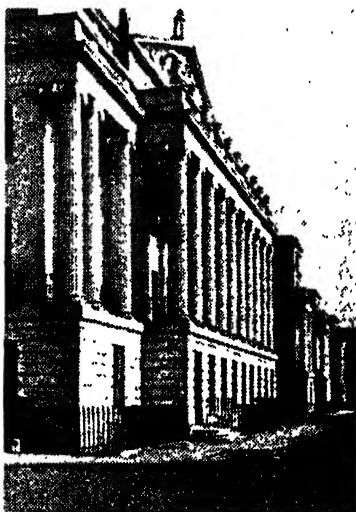
**Nascimento, Francisco Manoel do** (1734-1819), Portuguese poet and miscellaneous writer, b. Lisbon. He was compelled to flee from Portugal to escape the Inquisition, and d. at Versailles. In compliance with the literary fashion of his day, he wrote under the Arcadian pseudonym 'Filinto Elísio,' though far from ever having been a member of the so-called Arcadians. N. founded a school of rivals, named Filintists. His graceful lyrics and prose enriched the language, resisted foreign intrusions, and preserved national traditions. His influence in thereby reviving letters in his country was considerable, yet not so great as that of the less original Manuel de Bocage (q.v.). N. was especially famous for his lyrics, in which he succeeded in combining the classical purity of Horace's form with the new ideas and ideals of the Enlightenment. Among his works are romantic *contos* or scenes of Portuguese life. He is also remembered for his patriotic odes, notably *To Neptune speaking to the Portuguese* and *To the Liberty and Independence of the United States*.

**Naseby**, par. and vil. of Northants, England, 7 m. SSW. of Market Harborough. Near here was fought the famous battle which practically decided the issue of the Civil war on 14 June 1645. Prince Rupert commanded the right wing of the Royalist cavalry and, as usual, routed the forces opposed to him, who were led by Ireton. The king, in charge of the centre, was on the point of overpowering Fairfax, who was in command of the new model army of 14,000 foot and 7000 horse, when Cromwell, having put to flight the left wing of the Royalist army, hastened to the assistance of his chief. This movement decided the battle, especially as Rupert had lost his advantage by pursuing the fugitives too far. The Royalists were totally routed, the king's baggage taken, and his letters to the queen and to the Irish rebels, which showed that while negotiating with the Parliament he had no intention of coming to terms, were pub.

**Nash, Frederic Ogden** (1902- ), Amer. poet, b. Ilye, New York state. He was educ. at St George's School, Rhode Is., and at Harvard. After working for some time as a bond salesman, he joined the staff of a firm of publishers, and in 1931 pub. 2 vols. of verse, *Hurd Lines and Free Wheeling*, which attracted attention by uniting a vein of inspired nonsense with a substratum of sound philosophy, at the same time using a complete freedom of scansion and far-fetched rhymes reminiscent of the most fanciful clerihews. In 1931 Nash married and settled in Baltimore; he had 2 daughters, Llnell and Isabel, to whom a number of his poems are addressed. His books of verse include *The Face is Familiar*, 1942, *Good Intentions*, 1943, *Versus*, 1949, *Family Reunion*, 1951, *The Private Dining Room*, 1953, *Many Long Years Ago*, 1954, and *You Can't Get There From Here*, 1957.

**Nash, John** (1752-1835), architect, b.

London, the most prominent figure in 'Regency' architecture; trained by Sir Robert Taylor. Started as a speculative builder, then began practice as an architect about 1782 in Wales, where his first works were at Hereford and Carmarthen jails and at St David's Cathedral. He moved to London about 1796 and created a large country house practice with Humphrey Repton, the landscape gardener. Examples of their work are Southgate Grove and Sundridge Park. Nash then became the intimate friend and architect of the Prince Regent, afterwards George IV. His later work includes the



Jack Scherboom

CUMBERLAND TERRACE, ONE OF THE NASH TERRACES AROUND REGENT'S PARK, LONDON

lay-out of Regent's Park, Park Village, Regent Street, and Carlton House Terrace. He remodelled Carlton House and Buckingham Palace, and the Pavilion at Brighton; also designed Highgate Archway, the Haymarket Theatre, the United Services Club, and All Souls Church, Langham Place. See biography by J. Summerson, 1953.

**Nash, John Northcote** (1893- ), artist, second son of W. H. Nash, b. London; he was educ. at Wellington College, and joined the Artists' Rifles in 1916. He served in France, 1916-18, and was commissioned to paint war pictures for the Imperial War Museum. It is as an illustrator and wood-engraver that he is chiefly known. See his *Poisonous Plants*, engraved in wood (1927), and his illustrated eds. of Swift's *Directions to Servants*, 1925; Ovid's *Elegies*, 1925; Spenser's *Shepherdess*

*Calendar*, 1930; and others. See also J. Summerson, *John Nash* (2nd ed.), 1950.

**Nash, Paul** (1889-1946), painter, known especially for landscapes and water-colours, b. London. He was educ. at St Paul's School and the Slade School. In 1917 he was one of the official artists on the W. front. His work was exhibited at the Leicester Galleries in 1918 and in 1924. A painter of the Post-Impressionist school, he passed through various phases, and from about 1930 showed the influence of Surrealism in imaginative landscape. Though taught at the Slade School he had little in common with the orthodoxy of that institution. It was in 1911-12 that his water-colours began to attract attention at the New Eng. Art Club. His war pictures, poignant expressions in art of the desolation of the W. front, won instant popularity. One of the most striking is his 'Inverness Copse.' He was official war artist to the Air Ministry, 1940; to the Ministry of Information, 1941. He was engraver and designer as well as painter. Pub.: *Places, Prose Poems, and Wood Engravings*, 1922. See A. Burton, *Paul Nash*, 1955. His autobiography *Outline* was pub. in 1949. See Margot Eates, *Paul Nash Memorial Volume*.

**Nash, Richard**, or 'Beau Nash' (1674-1762), dandy, b. Swansea and educ. at Carmarthen Grammar School and Jesus College, Oxford, where he remained only a short time. Later he was given an ensign's commission, but soon left the army and then entered the Inner Temple, but never took up the law as a profession. A zest for pleasure and gaming drew him, in 1705, to Bath and thenceforth he made his living by gambling, and was noted for his extravagance. At Bath he estab. the first assembly-room, became the recognised autocrat of the tn, and was admired for his manners and taste, his sobriquet of 'Beau Nash' being an allusion to his foppery, his name having become proverbial in that connection. See life by Goldsmith, 1762, and L. Melville, *Bath under Beau Nash*, 1908.

**Nash, or Nashe, Thomas** (1567-1601), satirist, critic, and playwright, b. Lowestoft. He graduated at Cambridge in 1586. His first pub. was an acrid review of recent literature prefixed to Greene's *Menaphon*, which he discussed at greater length in *The Anatomie of Absurditie*, 1589. After this he was engaged in the Marprelate controversy for a time, and in 1592 pub. *Pierre Pennelesse, his Supplication to the Divell* as a reply to the savage denunciations of Richard Harvey. These were followed by *Strange News*, 1592; *Christi Teares over Jerusalem*, 1593, like Greene's pamphlets a picture of loose life in London, with the same kind of dubious contrition and denunciation of immorality; *The Terrors of the Night*, 1594, the theme of which is ghosts and superstitions, notable for the praise of Daniel's 'Delia'; *The Unfortunate Traveler, or the Life of Jack Wilson*, 1594, the best novel of adventure in England before Defoe's. Besides these he pub. *Have with you to Saffron Walden*, 1596, an onslaught on Gabriel Harvey; *The Isle*

*of Dogs*, 1597, a comedy in which he attacked the current abuses in the state, and for which he suffered imprisonment in the Fleet; *Lenten Stuffe*, 1599, an amusing description of Yarmouth; *Summer's Last Will and Testament*, a comedy, 1600. His works were ed. in 5 vols. by R. B. McKerrow, 1904-10.

**Nash, Walter** (1882- ), New Zealand statesman; b. Kidderminster. He went to New Zealand in 1909. He was elected to the National Executive of the New Zealand Labour Party in 1919. After unsuccessfully contesting the Hutt seat in 1925 and 1928, he became M.P. in 1929



*The High Commissioner for New Zealand*  
WALTER NASH

and has represented Hutt since that date. Minister of finance in the first Labour gov. of 1935 and deputy Prime Minister after 1940, he retained these offices until the party's defeat at the general election of 1949. He represented New Zealand in Washington during the Second World War and strongly supported Brit. policy. On the death of Peter Fraser in 1950 he became leader of the opposition. A key man in the campaign which brought the party to power, he conducted some delicate negotiations with the City of London, which showed no great enthusiasm for the nationalisation and social security aspects of the Labour gov.'s programme. N.'s interest in international affairs is shown by the long list of overseas conferences he attended before and after attaining office. At the general election in Nov. 1957 the Labour party was returned to power and N. became Prime Minister. His writings include *New Zealand: A Working Democracy*, 1944.

Nashua, co. seat of Hillsboro co., New



Hampshire, U.S.A., on the Merrimack R., 14½ m. from Manchester. There are manufs. of sheetings, paper products, tools, machinery, shoes, textiles, and hardware and wood products; it is a trade centre, with some farming. It was settled in 1655. Pop. 34,660.

**Nashville**, cap. of Tennessee, and co. seat of Davidson co., U.S.A., on the Cumberland R., 195 m. N.E. of Memphis. It is a great railway and commercial centre, with extensive trade in cotton and tobacco, and manufs. of cotton, silk rayon, hardwood flooring, fertiliser, flour, oil, paper, woollen goods, leather, etc. Printing and publishing are important industries, and it has a large lumber market. It is also the seat of many educational institutions, including Vanderbilt Univ., N. Univ., Fisk Univ., Meharry Medical College, the George Peabody College for Teachers, the Scarritt College for Christian Workers, Trevecca Nazarene College, Tennessee Agric. and Industrial State Teachers' College, the Andrew Jackson Univ., the David Lipscomb College, the Ward-Belmont School, and the School of Social Work. Here in 1864 the Federals defeated the Confederates (see **NASHVILLE, BATTLE OF**). N. was founded in 1780, incorporated as a tn in 1784, chartered as a city in 1806, and made the cap. of the state in 1843. Pop. 174,307.

**Nashville, Battle of**, in the Amer. Civil War, a victory for the Federal forces under Gen. Thomas against the Confederates under Gen. Hood. In Nov. 1864 Thomas was garrisoned in the tn of N., Tennessee, which had been surrendered to the Federals in Feb. 1862, and with his army of 50,000 men he faced the advance of Hood's superior force. A preliminary engagement took place at Franklin, where Gen. Schofield succeeded in retarding Hood's advance. On 15 Dec. 1864 Thomas advanced and succeeded in outflanking Hood on the left. This movement he followed up by a general attack which turned Hood's defeat into a rout. Hood's army was depleted of half its numbers and driven back across the R. Tennessee. The pursuit continued for 13 days as far as Lexington, Alabama, although impeded by floods. The B. of N. was one of the most decisive in the course of the civil war. See W. B. Wood and J. E. Edmonds, *Civil War in the United States*, 1937.

**Näsijärvi**, long narrow lake of SE. Finland, N. of Tampere (Tammerfors). It is connected via Kokemäki R. to the seaport of Porv; its area is 101 sq. m., and in parts it reaches a depth of over 300 ft.

**Nasik**, tn of Bombay state, India, situated 2000 ft up in hills 120 m. N.E. of Bombay. It is a favourite hot-weather resort. Here are situated the gov. of India currency press and security press. N. is a holy place for Hindus, being close to the source of the sacred R. Godavari, and is much frequented by pilgrims.

**Nasir-ed-Deen (Nasir Uddin)**, Mohammed Ibn Hassan (c. 1200-c. 1276), Persian astronomer, b. Toos in Khorassan and appointed superintendent of an observatory at Azerbaijan. He wrote the

*Ilchanic Tables*, somewhat resembling those of Ptolemy.

**Nasir ud-Din (1829-96)**, Shah of Persia (1848-96). Through the influence of his mother, a princess of the Qajar family, he became governor of Azerbaijan and heir apparent in place of his elder brothers. His succession to the throne was strongly opposed, particularly by the Babis (see **BAHA'Í**), but he wreaked savage vengeance on them. He signed a treaty of friendship with Russia and so remained neutral during the Crimean War. In 1856 he seized Herat, but evacuated it after a Brit. force landed in S. Persia, a treaty of peace being signed in Paris (Mar. 1857). He is famous as the first shah to visit Europe, which he did on 3 occasions with a sumptuous retinue. Various concessions were granted by N. to foreign nationals, including a tobacco monopoly to a Brit. subject. In 1891, which aroused great opposition and was finally abrogated (see *PERSIA, History*). N. was assassinated on 1 May 1896. He was succeeded by his son, Muzaffar ud-Din.

**Nasira**, see **NAZARETH**.

**Nasmith, David (1799-1839)**, originator of tn and city missions, b. Glasgow. In 1813 he became secretary to the Glasgow Youths' Bible Association and devoted himself to religious work, and in 1821-1823 was assistant-secretary to no fewer than 23 charitable societies. He founded the Glasgow City Mission in 1826, the Local Missionary Society for Ireland, the London City Mission, and the Brit. and Foreign Mission, besides about 32 in the U.S.A. and Canada.

**Nasmyth, Alexander (1758-1840)**, portrait and landscape painter, b. Edinburgh. He was a pupil of Allan Ramsay. In 1778 he estab. himself in Edinburgh as a portrait painter, and had Robert Burns among his sitters. Ultimately he confined himself to landscape painting, although much of his time was occupied in teaching, and in 1822 he pub. 16 views of places described in the Waverley novels. He was a member of the original Society of Scottish Artists, and an associate of the Royal Institution. See J. Nasmyth, *Autobiography*, 1883.

**Nasmyth, James (1808-90)**, engineer, the son of Alexander N., and brother of Peter. In 1834 he started business for himself at Manchester, subsequently establishing the Bridgewater foundry at Patricroft, where he invented the steam hammer. It was afterwards adopted by the Admiralty, N. having taken out a patent in 1842. He also invented a nut-shaping machine, a flexible shaft for driving small drills, and a hydraulic punching-machine; he was the first to observe, in 1860, a mottled appearance of the sun's surface called 'willow leaves' or 'rice grains.' He pub. *Remarks on Tools and Machinery*, 1858, and *The Moon considered as a Planet, a World, and a Satellite*, in conjunction with James Carpenter, 1874. See his autobiography (ed. S. Smiles), 1883.

**Nasmyth, Peter**, commonly known as Patrick (1787-1831), landscape painter, b. Edinburgh. His landscapes won for

him the name of 'the Eng. Hobbema.' The reputation of his works has greatly increased since his death; indeed one was sold at Christie's for 1300 guineas in 1892. Some of his paintings are 'Haslemere,' 'Turner's Hill, East Grinstead,' 'Cottage in Hyde Park,' 'A Country Road,' 'A Cascade,' 'Sir Philip Sidney's Oak, Penrhurst,' and 'View of St Albans.'

**Naso**, see OVID.

**Nassau**: 1. Former Ger. duchy, which was incorporated in 1866 in the Prussian prov. of Hesse-N. (see HESSEN). It lay E. of the Rhine and N. of the Main (qq.v.). The dist. is heavily wooded, and is known for its wine (see RHEINGAU), and for its numerous spas, notably Wiesbaden and Ems (qq.v.). The area of the duchy was 1830 sq. m. See ORANGE, HOUSE OF.

2. Cap. of the Bahamas (q.v.), formerly called New Providence, situated in the E. of the is. of New Providence. It has an international airport and is the main harbour of the Bahamas. Pop. (estimated, 1955) 25,000.

3. Uninhabited is. of N. Cook Group, belonging to people of Pukapuka, who visit it to gather nuts for copra; 40 tons were produced in 1954.

**Nasser**, or **Nasir**, **Gamal Abd al-** (1918- ), Egyptian soldier and politician, educ. at El Masria Secondary School, Cairo, and the Military Academy, Cairo. He served in the war of 1948 against Israel, and in 1952 was one of the leaders of the *coup d'état* of July which resulted in the abdication of King Farouk. From 1952-4 N. was deputy Prime Minister, and minister of the interior under Neguib (q.v.) in 1954. N. ousted Neguib from office (Dec. 1954) and ruled Egypt as head of a military junta. N. subsequently became Prime Minister, and later president of Egypt. On 26 July 1956 N. nationalised the Suez Canal (q.v.) and announced that revenues from it would be used for financing the Aswan High Dam project. Under his aggressive and opportunist leadership Egypt became the leader of Arab nationalism, though by 1958 the surviving Middle E. Arab monarchies had largely broken away from N.'s influence. By this time, however, the union of Egypt and Syria as the United Arab Rep. (q.v.) had brought N. considerable prestige in his own country. He became first president of the United Arab Rep. and has recently attempted to make himself the spokesman of all the (non-European) African states, being a violent critic of colonialism in Africa. See also EGYPT, *Modern History*.

**Nasturtium**, popular name for *Tropaeolum majus* and *minus* (q.v.).

**Natal**, original prov. of the Union of S. Africa, lies in the SE. portion of the continent, and is bounded on the E. by the Indian Ocean. The prov. has an estimated area of 35,284 sq. m. Zululand (10,425 sq. m.) was annexed to Natal in 1897, and the N. dists. of Vryheid, Utrecht, and part of Wakkerstroom, which formerly formed part of the Transvaal, were added to Natal ter. in 1903. The seaboard of Natal is 360 m. in length, and has only one bay of

importance, that of Durban. The country rises inland in a succession of terraces from the low and sandy coast, culminating in the heights of the Drakensberg, whose highest peak is Mont aux Sources (over 11,000 ft.). Majuba Mt (7000 ft) lies SW. of the pass of Laing's Nek, which leads into Transvaal ter. The country is watered by the Tugela, Buffalo, Klip, Mool, and other rivs., which are useful for irrigation purposes, although useless for navigation. There are no fewer than 35 distinct rivs. running into the Indian Ocean. The climate is subtropical on the coast but somewhat colder inland. The cooler or winter half of the year is considered as beginning in April and ending in Sept., the average number of rainy days being 13. Malaria in a mild form is present on the coast lands of old Natal, becoming more severe in Zululand and as one proceeds northwards along the coast. The rainfall at Durban is about 39½ in. and at Pietermaritzburg about 30 in., the greater part of which falls during the summer months, May, June, and July being comparatively dry. The prevailing wind is SE. in the summer months, as at the Cape of Good Hope. Occasionally the sirocco, or hot wind, from the NW. is felt. Heat which might otherwise be oppressive is generally tempered by the sudden thunderstorms so frequent in Natal during the hot months. The leading crops for export are sugar, maize, and wattle bark; other crops include lucerne, sweet potatoes, peas, pumpkins, and vegetables. Cotton and tobacco are also grown. The prov. is rich in mineral wealth, and asbestos, copper ore, fireclay, gold, graphite, gypsum, iron ore, lead and silver ore, nitre, oil shale, limestone, and marble, manganese ore, mica, nickel ore, and tin ore are found. Coal is mined in the Klip R., Vryheid, and Utrecht dists.

The wild animals still found include the leopard, panther, jackal, hyaena, wild cat, hippopotamus, crocodile, and sev. species of antelope, but the larger animals are gradually disappearing. There are many varieties of snakes, including the python. The birds, many of them of brilliant plumage, but mostly songless, include the vulture, eagle, secretary-bird, parrot, and flamingo. The Giants' Castle Game Reserve (50,000 ac.) is situated in the Estcourt dist. in the Drakensberg Mts. It contains eland, blesbok, red hartebeest, and numerous species of small game, and birds. The Natal National Park, although not essentially a game reserve, exists for the preservation of the natural flora and fauna of the Berg. It is 10,000 ac. in extent, is 65 m. from Ladysmith, and embraces some of the finest scenery in the Drakensberg Mts. The fisheries of Natal are notable. The prin. classes of edible fish found are red and silver bream, bass, rock cod, barracudas, and steenbrass. Whaling operations begin in May and end in Oct., the species of cetacea captured being sperm, humpback, finner, etc. Porpoise and dolphin abound all the year round on the coast. Rod and line salt-water angling on the coast is

popular and well organised. All fishing in Natal is administered under the Natal Fisheries Ordinance of 1910 by the Natal Fisheries Advisory Board. The cap. is Pietermaritzburg (q.v.). Durban (q.v.) is the prin. harbour not only for Natal but for the S.E. coast. Other important tns are Dundee, Ladysmith, and Newcastle (q.v.). Pop. (1951): Whites, 274,240; non-Whites, 2,141,078.

**Administration.** By the South Africa Act, 1909, which constituted the Union of

maritzburg. N. has 348 primary schools for Europeans, and 45 secondary and intermediate, all supported entirely or partly by gov. funds. For non-European children, there are 954 native schools, 137 Asiatic, and 34 other coloured schools, state and state-aided. There are, besides, technical colleges, a school for the training of teachers, and a school of physical culture.

**Religion.** The Christian pop. consists of members of the Church of England



*South African Railways and Harbours*

PIETERMARITZBURG: THE MAIN SHOPPING CENTRE

S. Africa, inaugurated in 1910 by the Duke of Connaught, Natal sends 8 members to the Union Senate and 17 members to the House of Assembly. It has an elected prov. council with a minimum of 25 members. These 25 elect 4 members to act with the administrator as the executive. The administrator is chosen by the governor-general of the Union in Council. He holds office for 5 years. The gov. of Zululand is in the hands of a prov. council and an administrator, appointed by the governor-general. Its executive consists of 4 members. There is a native High Court in Natal, with 5 judges to deal with peculiarly native cases.

**Education.** With the exception of higher and vocational education, which is under the control of the Union gov., education comes under the prov. administration. A univ. college is at Pieter-

maritzburg, with a bishopric at Pietermaritzburg, Roman Catholics, with a bishopric at Natal. Wesleyans, Baptists, Presbyterians, and Independents.

**History.** Vasco da Gama is reputed to have passed what is now Durban on Christmas Day, 1497, naming the country Terra Natalis, after the natal day of Christ; evidence, however, points to the fact that it was Pondoland which da Gama discovered. With the exception of the purchase of the Bay of Natal by the Dutch in 1685, arising out of the adventures of Van der Stel's expedition, the hist. of European settlement in Natal commences at the close of the first quarter of the last cent.; and prior to 1823 only a few ships had touched on the coast for wood and water. In 1823 Lt Farewell landed in the bay, and later one Fynn was sent overland to obtain a grant of ter. from Chaka, the formidable

paramount chief of the Zulus. Permission to settle was obtained from Chaka, but Chaka was assassinated in 1828 by Dingaan, his half-brother, whose followers were hostile to the white settlers and their native allies. Matters were not settled until 1831, when Fynn was recognised as the 'great chief of the Natal Kaffirs.' In 1835 Dingaan granted a concession of land to Capt. Gardiner, who formed a Brit. colony at Durban. In 1837 the Boers, trekking N. from Cape Colony, first entered Natal, and having crushed the Zulus at Blood R., Dec. 1838, attempted to establish a rep., and in 1840 the flag of the Dutch rep. of 'Natalia' was in fact actually hoisted on the shores of the bay and was followed by a proclamation taking possession of all land between the Tugela and Black Umfolozi R.s. The Brit. Gov. refused to acknowledge the independence of the new state, and in 1842 a small force was sent to drive the Boers out, but was repulsed. One of the settlers, Richard King, however, rode through the Boer lines a distance of 600 m. to Grahamstown and so secured relief. On 8 Aug. 1843 Natal was finally proclaimed a Brit. colony (annexed to Cape Colony) and the Boers moved westwards to the Transvaal. In 1856 Natal was declared an independent colony. In 1879 Cetewayo, King of the Zulus, was defeated and captured, and in 1897 Zululand was annexed to Natal. In 1881 the Transvaal Boers invaded the country and defeated the Brit. at Majuba Hill (q.v.). In the war of 1899-1902 Natal was the scene of some of the fiercest fighting: Eludlaarske, Glencoe, Ladysmith, and the second battle of Majuba Hill. After the war Utricht, Vryheid, and part of Wakkerstroom were added to Natal. In 1906 there was a formidable Zulu rising along the Tugela R., which was suppressed with great loss to the natives. In 1907 there was another outbreak which ended in the arrest of Dinizulu (d. 1913). On 31 May 1910 the colony of Natal was merged in the Union of S. Africa, becoming an original prov. of the Union. See H. Brooks, *Natal*, 1876; J. Ingram, *Natalia*, 1897; R. Russell, *The Garden Colony: the Story of Natal and its Neighbours*, 1910; A. T. Bryant, *Olden Times in Zululand and Natal*, 1929; C. Mackeurtan, *Cradle Days in Natal*, 1930; C. Fuller, *Louis Trichard's Trek across the Drakensberg, 1837-8*, 1932; M. Nathan, *The Voortrekkers*, 1937; A. F. Hattersley, *Annals of Natal*, 1936-40; volumes of Natal Regional Survey, such as *Archaeology and Natural Resources of Natal*, 1951; T. V. Bulpin, *To the Shores of Natal*, 1954.

**Natal**, tn and seaport of Brazil, cap. of the state of Rio Grande do Norte. It stands on the r. b. of the Potengi R., 80 m. from Paraíba and 260 m. SE. of Fortaleza. Exports sugar and cotton, as well as salt, carnauba wax, and hides. Its industries are cotton spinning and weaving and salt-refining. There are rail connections with Pernambuco, Macaé, and Paraíba. There is a large airport, used by transatlantic air services, 8 m. from the city. Pop. 100,000.

**Natal**, Port, name of the first settlement at Natal lagoon (1824), S. Africa, later named Durban (q.v.).

'**Natal Mercury**,' S. African daily newspaper, estab. 1852, and pub. in Durban, with a wide influence throughout Natal and Zululand and circulating in other provs. It is independent and strictly non-party, emphasising democratic principles in political affairs. Associated with it is the *South African Woman's Weekly*.

'**Natal Witness**,' independent S. African prov. newspaper, with 3 eds. daily, estab. in 1846, pub. in Pietermaritzburg, cap. of Natal prov. It is the oldest newspaper pub. in Natal and appeals to all members of the public.

**Natchez**, port of entry and co. seat of Adams co., Mississippi, U.S.A., 145 m. (direct) NNW. of New Orleans. Cotton is the chief industry, and there is shipping trade in cotton. There are also candy factories, canning factories, and a lumbering industry. The Jefferson Military College is at N. There are sev. fine churches. Its old name under the French was Fort Rosalie and it remained a Fr. military and trading post till the Seven Years War, when it came into Eng. possession under the name of Fort Panmure. It was a bone of contention between the Americans and Spaniards in the late 18th cent., when the former were seeking outlets for their W. products, the Spaniards refusing to surrender it on the plea that England's title, under which the Americans claimed it, was defective. It was in Sp. occupation from 1779 to 1798; in 1798 it became the cap. of the new ter. of Mississippi, but in 1820 the cap. was removed to Jackson. Pop. 22,700.

**Natchez**, tribe of N. Amer. Indians, whose original ter. extended along the Gulf of Mexico. They had a monarchical gov., with an aristocratic sun caste; on the death of a member of the caste kin and companions were killed to accompany him to the world of spirits. In 1700 they were about 4000, but were almost exterminated by the French; to-day their language and culture are extinct.

**Nathan**: 1. Trusted prophetic adviser of King David. He rebuked the latter, for his adultery with Bathsheba and murder of Uriah, by means of the parable of the 'one ewe lamb' (2 Sam. xii).

2. Name of probably the third son born to David by Bathsheba (2 Sam. v). The right of succession to David passed to Salathiel, the descendant of N., referred to in Zech. xii. N. thus appears as an ancestor of Our Lord (Luke iii., 31).

**Nathan, George Jean** (1882-1958), Amer. dramatic critic, b. Fort Wayne, Indiana. He was educ. at Cornell Univ., New York state, and the univ. of Bologna in Italy. He served at various times on the editorial staff of the *New York Herald* and as dramatic critic of various pubs., including *Harper's Weekly*, *Smart Set*, and the *American Mercury*, the latter of which he founded with H. L. Mencken. In his critical work he is often mordant and always independent. Among his pub. works are *Bottoms Up*, 1917, *The Popular Theatre*, 1918, *Comedians All*, 1919, *The*

*New American Credo*, 1927, *Art of the Night*, 1928, *Testament of a Critic*, 1931, *The Avon Flows*, 1937, *The Morning after the First Night*, 1938, *Encyclopaedia of the Theatre*, 1940, *The Entertainment of a Nation*, 1942, *Since Ibsen*, 1943, and an ann. theatre book (since 1942). It became known after his death that he was received into the Rom. Catholic Church in 1957.

Nathan, Robert (1894- ), Amer. novelist, b. New York City. He was educ. at Harvard Univ. Most of his novels, like *Autumn*, 1921, *Youth Grows Old*, 1922, *The Puppet Master*, 1923, and *The Fiddler in Barly*, 1926, are distinguished by their note of gentle wistfulness and a mellow style. In *Jonah*, 1925, pub. in England as *The Son of Amittai*, an adaptation of the biblical story, he struck a new note of irony. This was reinforced in his *There is Another Heaven*, 1929, the story of a converted Jew's experience in a very Protestant heaven. His other works include *One More Spring*, 1933, *Road of Ages*, 1935, *Winter in April*, 1938, *Portrait of Jennie*, 1940, *They Went on Together*, 1941, *The Sea-gull Cry*, 1942, *But Gently Day*, 1943, and *Mr Whittle and the Morning Star*, 1947. *A Cedar Bor*, 1929, *Winter Tide*, 1940, and *Darkening Meadows*, 1945, are vols. of verse.

Natick, tn of Massachusetts, U.S.A., in Middx co., 16 m. WSW. of Boston. Manufs. include boots and shoes, mince-meat, and metal products. There are canned goods factories, boxes and corrugated paper are manuf., and fruit farming is important. Pop. 19,938.

**National Anthems.** Patriotic hymns, to be sung at public ceremonies and on similar occasions, are of comparatively recent date. The Brit. *God save the Queen* (q.v.) is the earliest example and has been adopted (and adapted) by other countries, including Switzerland (*Rufst du, mein Vaterland*), Germany (*Heil dir im Siegerkranz*), and Denmark, while in the U.S.A. the air is sung to *My Country*, 'tis of thee, by Samuel Smith.

Other N. A. are:

Abyssinia, see ETHIOPIA.

Albania: *Rrethi Fla mu rit te per bashkai*, poet and composer unknown.

Argentina: *Oid, mortales, el grito sagrado Libertad*; words by Vicente López y Planes (1813); tune by José Blas Parera, revised by Juan P. Esnaola.

Armenia: words by Sarmen; tune by Khatchaturian (1945).

Australia: *Advance, Australia fair* (broadcast, but not actually adopted as a national anthem); words by P. Dodd McCormick (before 1916); tune by W. W. Francis.

Austria (Imperial): *Gott erhalte Franz den (or unsern) Kaiser*; words by L. Haschka; tune by J. Haydn (1797). (Republican): *Österreichische Bundes-hymne*, 'Sei gesegnet ohne Ende'; words also by L. Haschka; tune as above. (Republican, 1920-9): *Deutsch-Österreich, du herrliches Land, wir lieben dich*; words by K. Renner; tune by Kienzl (1920). (Nazi): *Lied der Jugend*, 'Ihr Jungen schliesst die Reihen gut'; words and tune

by H. Leopoldi (c. 1933). From 1946. *Land der Berge, Land am Strome*, tune by Mozart; words by P. Preradovic.

Bavaria: *Bayern, mein Heimalland*; words by F. Beck; tune by F. Lachner (1848); also *Gott mit dir, du Land der Bayern*; words by M. Öchsner; tune by F. M. Kunz.

Belgian Congo, see CONGO.

Belgium: *La Brabançonne*, 'Qui l'aurait dit de l'arbitraire' (now 'Après des siècles d'esclavage'); words by Jenneval (1830); tune by F. van Campenhout (L. A. II. Dechez, 1830). (Flemish): *De Vlaamsche Leeuw*; words by H. van Peene; tune by K. Miry.

Bolivia: *Bolivianos, el hado propicio*; words by Ignacio de Sanjinés; tune by B. Vincenti.

Brazil: *Ouviram do Fpiranga as margens placidas*; words by J. O. Duque Estrada; tune by F. Manoel da Silva. (Earlier): *Seja um pallio luz*; words by M. Albuquerque; tune by L. Miguez.

Bulgaria: *Shoumi Maritza*; words by Maracek; tune by G. Sebek. (Since 1946): *Bulgaria mila*, words and tune by var. authors.

Burma: *Naing-gan-daw-Thachin*, a revision of the *Doh-Ba-Ma* song composed by M. B. Saya Tin in 1930 and finally amended by the Constituent Assembly in 1947.

Canada: *The Maple Leaf for ever*, 'In days of yore, from Britain's shore'; words and tune by A. Muir (1867). (Fr.) *O Canada: terre de nos aïeux*; words by A. B. Routhier (1880); tune by C. Lavalée (adapted from the priests' march in Mozart's *Magic Flute*).

Chile: *Dulce patria*, 'Ha cesado la lancha sangrienta'; words by E. Lillo (1847); tune by Carnicer (1828).

China: *Tsung-kuoh hung li juh dechow tiän*; author of words and composer of tune unknown (1912). (Democratic): *The Song of Kuomintang*; words by Sun Yat-sen; tune by Ch'eng Mao-yun (1928). (Communist): tune only, temp.

Colombia: *Oh! Gloria inmarcescible*, 'Cesó la horrible noche'; words by R. Núñez; tune by O. Sindici (c. 1905).

Congo (Belgian): *Vers l'aventur: Naar wijden zijd*, 'Le siècle marche'; 'De tijd spoedt heen'; words by G. Th. Antheunis; tune by Gevaert (1908).

Costa Rica: *Noble patria, tu hermosa bandera*; words by J. M. Zeledón; tune by M. M. Gutiérrez (1851), in use from 1853.

Cuba: *Himno Bayamés*, 'Al combate corred bayameses'; words and tune by P. Figueredo (1868).

Czechoslovakia: Combination of *Kde domov můj*; words by J. K. Tyl; tune by Skroup (1834); and *Nad Tatrou sa blýska*; words by J. Matúška (1844); tune traditional (first officially used 1919).

Denmark: *Kong Kristian stod ved højen mast*; words by J. Ewald; tune by J. E. Hartmann (from opera *Fiskerne*, 1780); also *Der er et yndigt land*; words by A. Oehlenschläger; tune by H. E. Krøyer (19th cent.); and *Dengang jeg drog afsted*; words by F. Faber; tune by J. O. E. Horneman (19th cent.).

Dominican Rep.: *Quisqueyanos valientes, alcemos*; words by E. Prud'homme; tune by J. Reyes (1900).

Ecuador: *Salve! Oh patria, mil veces*, 'Indignados tus hijos del yugo'; words by J. L. Mera; tune by A. Neumann (1866).

Egypt: (march) *Ila ni an bë au da lo samil na kam*; author of words unknown; tune possibly by Verdi.

Eire, see IRELAND, REPUBLIC OF.

England, see above.

Estonia: *Mu isamaa, mu õnn ja rõõn*; words by J. Jannsen (1865); tune by Pacius (1848).

Ethiopia: *Etiopia hoy, des yibalish*; words by a group of Ethiopian scholars (1930); tune by M. K. Nalbadiau (1925).

Finland: *Maamme*, 'Oi maamme suomi synnylmaaa'; words by J. L. Runeberg (originally in Swedish), 1843; tune by Pacius, as for Estonia. A second tune by Pacius was also adopted.

France: *La Marseillaise*, 'Allons, enfants de la patrie'; words and tune by Rouget de Lisle (1792).

Germany (Imperial): *Heil dir im Siegerkranz*; words by H. Harries (1790), adapted by B. G. Schumacher, 1793; tune as for Great Britain; also, after 1870, *Die Wacht am Rhein*, 'Es braust ein Ruf wie Donnerschall'; words by M. Schneckenburger (1840); tune by C. Wilhelm (1864). (Republican): *Deutschland, Deutschland über alles*; words by H. A. Hoffmann von Fallersleben (1841); tune by J. Haydn, as for Austria. New words, 'Einigkeit und Recht und Freiheit', adopted in 1950. (Nazi): *Horst Wessel Lied*, 'Die Fahne hoch, die Reihen dicht geschlossen'; words by Horst Wessel; the tune may have been adapted from a Bohemian comic song; in use 1933-45.

Greece: *Se nomizo apo ten kansi tu spatia ten tromere*; words by D. Solomos (1824); tune by N. Mantzaros; in use since 1863.

Guatemala: *Guatemala feliz*; words by J. J. Palma; tune by R. Alvarez Oralle; in use from 1896.

Haiti: *La Dessalinène*, 'Pour le pays, pour les ancêtres'; words by J. Lhérisson; tune by N. Geoffard (1903).

Hawaii: *Hawaii pono*; author of words and tune unknown, but possibly by Kalakaua, King of Hawaii (c. 1880).

Holkar's Dominions, see INDORE.

Holland: *Wilhelmus van Nassouwe*; words by Philip van Marnix (c. 1570); composer of tune unknown (first pub. 1626); also *Wien Neerlands bloed in d' aderen vloei*; words by H. Tollens; tune by J. Wilms (1815).

Honduras: *Compatriotas, de Honduras los fueros*; words by A. C. Coello; tune by C. Hartling.

Hungary: *Himnusz*, 'Ysten áldd meg a Magyarát'; words by F. Kölcsey (1823); tune by F. Erkel (1845); usually followed by *Sózsal*, 'Házának rendületlenül légy híve oh magyar'; words by M. Vörösmarty (1836); tune by B. Erőssy (1844).

Iceland: *O Guð vors land*; words by M. Jochumsson (1874); tune by S. Sveinbjörnsson.

India: *Jana Gana Mana* by Rabindranath Tagore. In addition, *Bande*

*Matram* by Bankin Chandra Chatterjee is honoured as a national song.

Indore: *Prubho prarth ana parisa amuchi*; author of words unknown; tune by Jad.

Iran, see PERSIA.

Iraq: *Royal Salute* (march); no words; tune by A. R. Murray.

Ireland, Rep. of: *A Soldier's Song*; words by P. Kearney; music by P. Kearney and P. Heaney (c. 1910).

Israel: *Hatikwa* (Hope); words by Naftali Herz Imber, in 1878. The song was first called *Hatikvenu*. Only 8 years later Imber called it *Hatikwa* in his collection *Barkai* (Jerusalem, 1886). There are 2 views as to the melody and composer. According to the one, the tune was taken from *Ma Vlasti* (My Country), a cycle of 6 symphonic poems by the Czech composer Smetana. According to the other, it had been composed by a Sephardic Jew, Henry Busato (or Hussotot), on the basis of the liturgical music of *Hallel* (Psalm 117).

Italy: *La murcia reale*; no words, tune by G. Gabetti (1831). (Sung in S. Italy): *Inno di Garibaldi*, 'All' armi, all' armi, si scopron le tombe'; words by L. Mercantini; tune by A. Oliveri (1838). (Fascist): *La Giovinezza*, 'Sù, compagni in forti schiere'; words by M. Maumi; tune by G. Castaldo after G. Blanc (1921). (Rep.): *Inno di Mameli*, 'Fratelli d'Italia'; words by G. Mameli; tune by M. Novara (1847).

Japan: *Kimigayo*; the words are from the 9th cent.; tune by Hayashi Hirokami, revised by F. Eckert (1880).

Jewish, see ISRAEL.

Jugoslavia, see YUGOSLAVIA.

Latvia: *Dievs, svētī Latviju*; words and tune by K. Buiumans.

Lebanon: *Kulla nā lil watan*; words by R. Nachleh; tune by M. El-Murr (1926).

Liberia: *Salve, Liberia, Salve*; words by President Warner; tune by O. Luca (1860).

Liechtenstein: *Oberst am deutschen Rhein lehnet sich Liechtenstein*; words by H. H. Jauch (1850); tune as for Great Britain.

Lithuania: *Lietuva teisyne mūsų*; words and tune by V. Kudirkas (1918).

Luxembourg: *Ons Hémich, 'Wô d' Uolzécht d'urëch d'Wisen zët*; words by M. Lentz (1859); tune by J. A. Zinnen.

Malta: *T'għira lil Málta*, 'Int sabha, Málta tana'; words by G. A. Vassalla; the tune is a Bersaglieri song adapted (20th cent.). (After 1942): 'Lil din l-art Helwa'; words by C. Psaila; tune by R. Samut.

Mexico: *Mexicanos, al grito guerra*; words by F. G. Bocanegra; tune by J. Nunó (1854).

Montenegro: words by J. Soundechitch; composer of tune unknown; also *Onam, onamo! za brda ona*; words by Prince Nikola (1867); tune by Davorin Jenko.

New Zealand: *God save the Queen*; (National Song): *God defend New Zealand*; words by T. Bracken; tune by J. J. Woods.

Newfoundland: *When sun rays crown thy pine-clad hills*; words by Sir Charles Cavendish Boyle; tune by Sir Hubert

Parry. (This does not displace *God save the Queen*.)

Nicaragua: *Hermosa soberana*; words by Blas Villatas; tune by A. Cousin. (After 1917): words by S. I. Mayorga; composer of tune unknown.

Norway: *Ja, vi elsker dette landet*; words by Bjørnson; tune by Nordraak (1859).

Orange Free State: *Hef, Burgers, 't lied der vrijheid aan*; words and tune by Hamelberg.

Pakistan: No decision regarding a national anthem for the dominion has been made.

Panama: *Alcanzamos por fin la victoria*; words by Gerónimo de la Osa; tune by S. Jorge (1903).

Paraguay: *Paraguayos, República ó muerte*; words by F. Acuña de Figueroa; tune by F. Dupey.

Persia: *Shāhanshān—a mā Zandah bādā*; words by S. Afsar; tune by N. Moghaddam (c. 1934).

Peru: *Somos libres, séamos lo siempre*; words by José de la Torre Ugarte; tune by J. B. Alcedo (1821).

Philippine Is.: *Tierra adorada (Marcha nacional filipina)*; words by J. Palma; tune by J. Felipe (c. 1898).

Poland: *Jeszcze Polska nie zginieła*; words by J. Wybicki; tune wrongly attributed to M. K. Ogiński (1795), newly harmonised by K. Sikorski (1948).

Portugal (Royal): *O patria, O rei, O povo*; words and tune by Pedro I of Brazil, formerly Pedro IV of Portugal (1822). (Republican): *Heróis do mar*; words by Lopez de Mendonça (1890); tune by A. Keil; used since 1910.

Prussia: *Borussia*; words by G. R. Düncker; tune by Spontini (1818); also *Ich bin ein Preusse*; words by B. Thiersch; tune by A. H. Neithardt (1826).

Rumania (Royal): *Trăiască Regele în pace şi onor*; words by V. Alexandri; tune by E. A. Hübner (1861). (Republican): *Te slăvim Românie*, 1951.

Russia (Imperial): *Bozhe Tsarya khrani*; words by W. A. Zhukovskiy (1833); tune by Lvov (1833). (Soviet to 1944): *L'Internationale*, 'Debout, les damnés de la terre'; words by E. Pottier (trans. into Russian last in 1932); tune by P. Degeyter. (Soviet after 1944): *Gymn Sovetskogo Soюза*; words by S. Mikhalkov and I. Registan; tune by A. V. Alexandrov (c. 1942).

Salvador: *Saludemos la patria orgullosa*; words by J. J. Cañas; tune by J. Aberte.

Scotland: *Scots wha hae wi' Wallace bled*; words by R. Burns (1793); tune traditional.

Serbia: *Srpska Himna*, 'Bože pravde, ti što spase'; words by J. Djordjević; tune by D. Jenko (1872).

Siam: *Taurasoen Barami*; source of words and tune unknown.

S. Africa (Union): *Die Stem van Suid-Afrika*; words by J. C. Langenhoven; tune by M. L. Villiers (1938).

Spain (Royal): *Marcha real*; no words; tune by an unknown Ger. composer (1770); also *Hymno de Riego* (c. 1860); author of words unknown; tune by

Huerta. (Republican): *Marcha grandera*, adapted, and Ger. Nazi and It. Fascist songs also used.

Sweden: *Du gamla, du fria, du fjällhöga Nord*; words by R. Dybeck; tune traditional (1844).

Switzerland: *Rufet du, mein Vaterland*; words by J. H. Wyss (1811), with Fr. and It. trans.; tune as for Great Britain; also *Schweizerpsalm*, 'Trittst im Morgenrot daher'; words by L. Widmer; tune by Josef (Father Alberik) Zwysig (1841).

Transvaal: *Kentjif dut volk vol heldenmoed*; words and tune by Catherine Félicie van Rees.

Tunisia: *Marche beylicale*; no words; tune by an It. composer (1881-3), adapted by Sidi-Sadock.

Turkey: *İstiklâl marşı* (March of Independence); words by M. A. Ersoy; tune by O. Z. Ungör.

Uruguay: *Orientales, la patria ó la tumba!*; words and tune by J. Coppetti, U.S.A.: *The Star-spangled Banner*, 'Oh, say, can you see, by the dawn's early light!'; words by F. Scott Key (1814); tune by J. Stafford Smith; officially adopted 1831; earlier *Hail Columbia*; words by J. Hopkinson; tune by Fyfe (c. 1800).

U.S.S.R., see RUSSIA.

Venezuela: *Gloria al bravo pueblo*; words by V. Salias; tune by J. Landaeza (after 1810).

Wales: *Mac hen wlad fy nhadau (Land of my Fathers)*; words by E. James, English by J. Owen; tune by J. James.

Westphalia: *Ihr mögt den Rhein, den stolzen, preisen*; words by E. Ritterhans; tune by J. Peters (1868).

Württemberg: *Preisend mit viel schönen Reden*; words by J. Kerner (1826); tune traditional.

Yugoslavia: A compound of the Serbian hymn *Bože pravde* (see SERBIA); the Croatian hymn *Lijepa naša domovino*; words by A. Mihanović; tune by Lichtenegger; and the Slovene hymn *Naprej zastava Slav*; words by S. Jenko; tune by D. Jenko.

Zanzibar: National march for military band by Sir Donald Francis Tovey.

National Art-Collections Fund (incorporated by royal charter), The Wallace Collection, Manchester Square, London, W.1. Founded in 1903 to organise public opinion and secure works of art of all times to enrich the museums and galleries of the Brit. Commonwealth. The society has raised over £750,000 for the purchase of works of art. It has acquired by gift, bequest, or purchase many thousands of such works for presentation to public museums and galleries, including pictures, drawings, lithographs, etchings, and engravings of almost every period and school, MSS. and illustrated books, porcelain and pottery, both of the E. and of the W., armour, coins and medals, enamels, bronzes, silver and other metal work, jewellery, ivories, furniture, lace, embroidery and textiles, statues, and other objects of plastic art. Its achievements were reflected in a remarkable exhibition at the National Gallery in 1946 of works it had saved for the nation. Membership is open to all. Each member makes a

minimum ann. contribution of 1 guinea and receives various privileges from museums and galleries, opportunities of visiting private collections not otherwise open to the public, and an illustrated ann. report. Management: committees and secretary.

**National Assembly**, first of the Fr. revolutionary assemblies, lasting from 1789 to 1791; since its chief work was the formation of a constitution, it is often called the Constituent Assembly.

**National Assistance Act (1948)**. Fundamental purpose of this Act was to achieve the final replacement of the poor law by entirely new services founded on recent conceptions of social welfare. Under the Act a National Assistance Board administers a state scheme of financial aid for all persons in need who fall outside the national insurance scheme (*see* NATIONAL INSURANCE ACT (1946)), or whose requirements are not wholly met from that or any other source. The cost of this service falls on the Exchequer. Provision is made for a local gov. welfare service, of which an important feature is the provision of residential accommodation for old and infirm people and others who require care and attention. Residential hostels, when built, will be open to all, irrespective of means, and they will provide accommodation in return for payment. Sick persons who need hospital treatment are the responsibility of the national health service. (*See also* NATIONAL HEALTH SERVICE.) The local authority welfare service also extends to the blind and other handicapped persons.

The only qualification for national assistance is the need according to general standards prescribed in regulations requiring parl. approval. Any person aged 16 years or over who is in need may apply for assistance, and where need is estab. the assistance will provide for any dependants as well as the applicant. Discretionary power is given to deal with special cases. There is no household means test. Resources as well as requirements of applicants and their wives are considered jointly. No account is taken of the income of earning sons and daughters, but they will be deemed to be making a reasonable contribution towards rent and other household expenses. Directions about treatment of capital in the Act are that the first £375 of War Savings shall be ignored. Capital not so disregarded will also be ignored if it is less than £50. If it amounts to £50 or over, but not more than £400, it will reduce the weekly assistance by 6d. for the first £75, and 6d. for each further complete £25. Assistance is not generally payable if capital exceeds £400. Applications will be dealt with by local officers of the board. There is a right of appeal. A condition of assistance may be registration for employment, and persons who neglect or refuse to maintain themselves or their dependants may be refused assistance unless they attend a course of training or instruction or enter a re-estab. centre. Re-estab. centres may also be used for vagrants. Local authorities are also obliged to provide and

maintain temporary accommodation for vagrants in reception centres. It is a responsibility of the National Assistance Board to make provision whereby persons without a settled way of living may be influenced to lead a more settled life. . . .

The second group of services are under the local authority, and include residential accommodation for the aged, the infirm, and others, with special welfare services for handicapped persons. These services are entrusted to co. and co. bor. councils in England and Wales and co. councils and large burghs in Scotland. The residential accommodation, board, lodging, and attendance is intended for all who cannot wholly look after themselves. It includes amenities such as hot and cold water and laundry services. The local authority fixes a standard charge which those who can afford it will pay in full. By the National Assistance (Charges for Accommodation) Regulations, 1955-8, those who cannot afford it will pay according to their resources and commitments, subject always to a minimum of 40s. a week, and everyone is assumed to need 10s. a week pocket money.

Persons with less than 50s. a week will be referred to the National Assistance Board to have their income made up to this sum. Local authorities are also empowered to extend to the deaf, the dumb, and the crippled the same welfare services which are provided for the blind. The authorities may arrange for voluntary organisations to act as their agents in providing residential accommodation and specialised welfare services. The Act requires the registration of private institutions for the care of the old and disabled, and local authorities are empowered to inspect and withhold registration in unsatisfactory cases. Liability for maintenance which formerly rested on a wide range of relatives is reduced by the Act to a simple liability of a man to maintain his wife and children and a woman to maintain her husband and children.

Between 1 April 1956 and 31 Mar. 1957 the number of cases currently receiving N. A. under the Act was 1,699,000 (to the nearest thousand), and the amount paid in grants for the year ending 31 Mar. 1957 was some £112,242,000. The National Assistance (Determination of Need) Amendment Regulations, 1957, came into operation on 27 Jan. 1958; these revised the ordinary scale of payments in respect of requirements other than rent. *See also* POOR LAW, HISTORY OF.

**National Association of Boys' Clubs**, *see* BOYS' CLUBS.

**National Association of Mixed Clubs and Girls' Clubs**, *see* MIXED CLUBS AND GIRLS' CLUBS.

**National Bank of Australasia**, estab. in 1858, acquired the undertakings of the Colonial Bank of Australasia in 1918 and of the Bank of Queensland in 1922. Head office, Melbourne.

**National Bank of Egypt, The**, founded by Sir Ernest Cassel, and incorporated by



khedivial decree, 1898, acquired the Egyptian business of Lloyds Bank in 1926. In 1939 an agreement was reached for a new charter for 40 years until 1979 and constituting the bank as the central bank for Egypt. Head office in Cairo.

**National Bank of India**, estab. in Calcutta, 1863, and registered in London on 23 Mar. 1866. The head office is in London.

**National Bank of Mexico**, estab. in Mexico, 1881, as Banco Nacional Mexicano; name changed in 1884. In 1934 new statutes were adopted in accordance with the new banking law. Head office, Mexico. The bank directly controls Pan-Am. Trust Co. (incorporated in the State of New York).

**National Bank of Scotland Limited**, The, was estab. in Edinburgh in 1825 as the result of the amalgamation of 3 distinct banking ventures projected in the previous year. When business commenced the paid-up capital was £500,000 and early in the bank's list, a comprehensive branch system was decided upon. In 1831 the bank obtained a charter of incorporation. Two years later it took over the Commercial Banking Co. of Aberdeen, and in 1836 the Perth Union Bank was absorbed. A branch was opened in London in 1864, a step later followed by the other Scottish banking companies. An important event occurred in 1918 when Lloyds Bank Ltd acquired a controlling interest by the purchase from the holders of almost the whole of the capital stock of the bank.

**National Bolshevism**, a post-1917 Russian political trend whose adherents, without being Communist, hold that the Bolsheviks are the only party capable of providing effective gov. in Russia and of defending Russian national interests. In the 1920's N. B. found its expression in the Change of Landmarks movement, both in Russia and among Russian émigrés. Later it became a major element in Stalinism (q.v.) and was particularly strong during the Second World War. Among leading representatives of N. B. were Gen. Brusilov and the writer, A. N. Tolstoy.

**National Book League**, non-profit-making cultural society, founded in 1944 as the successor of the National Book Council begun in 1924. The N. B. L.'s object is to promote the wider use and enjoyment of books, and most of its members are drawn from the general public, with many educationists, writers, and members of the book trade belonging to it and supporting it strongly. Among its corporate members are a large number of schools and education authorities, most of Great Britain's public libraries and many commercial organisations, and there are overseas members in more than 70 countries. The N. B. L.'s activities cover every aspect of books, primarily from the reader's point of view, and also touch on the problems of authorship and book production.

Examples of the league's normal activities are its frequent London and

travelling exhibitions, among the most important of which are the travelling school library exhibition, which is used by education authorities to inform their teachers, and the exhibitions of Brit. book design and international book design; a jour., *Books*, pub. 8 times a year; a book information bureau which answers queries of every kind about books; work for the wider use of books in industry; and work with the armed forces of the Crown. N. B. L. pubs. include book lists, readers' guides, and other aids, both for the general reader and for the advanced student. The London H.Q. are at 7 Albemarle St. W.1, with exhibition galleries, members' rooms, a library of 'books about books and authors,' and a restaurant. The N. B. L. ann. lecture was inaugurated in 1943 when Dr Wm Temple delivered it; among recent lecturers have been Prof. G. M. Trevelyan, T. S. Eliot, Bertrand Russell, John Masfield, and Sir Norman Birckett.

**National Central Library**, London, was founded in 1916 as the Central Library for Students. In 1930 it was reconstituted as the N. C. L. and in 1931 was incorporated under royal charter. Its original purpose, that of providing books for organised classes for adult education, has since been extended so that it is now the recognised national centre for the loan, between libraries of all kinds both within Great Britain and abroad, of books for study which cannot be obtained in any other way. It also houses the Brit. National Book Centre for the allocation of duplicate and 'unwanted' books to suitable libraries, including war-damaged collections, at home and abroad. The library lends, from its own stock, books on many subjects, with certain notable exceptions, such as books which are available at the local library, works of fiction, and the set text-books required for examinations. In addition, it is in a position to obtain on loan from other libraries a very large percentage of those books which it is unable to supply from its own shelves. Serving the N. C. L. are all the public and many special and college libraries organised in regions. It has, in this way, access to about 21 million vols. as well as many thousand sets of periodicals. The library is maintained by a Treasury grant and by other voluntary grants and subscriptions. Books can be borrowed only through a local library. See also LIBRARIES (LIBRARY CO-OPERATION).

**National Coal Board**, see COAL MINES, NATIONALISATION OF.

**National Convention**, revolutionary assembly of France, consisting of 749 members chosen by universal manhood suffrage, which on 22 Sept. 1792 supplanted the legislative assembly, proclaimed the rep., and condemned Louis XVI to the guillotine. In spite of its internal dissensions it succeeded in suppressing the Royalists in La Vendée and in the S., notwithstanding the rest of Europe leagued against it, not only in the field, but in diplomacy. It laid the foundation of sev. modern Fr. institutions,

and dissolved itself in favour of a directory of five on 26 Oct. 1795.

National Debt, *see* PUBLIC DEBT.

**National Dental Service.** Provision is made under the National Health Service (q.v.) Act, 1946, for treatment by dentists who join the service. Any dentist may at his option take part in the service or not. Of some 10,000 dentists in general practice in England and Wales the number in the N. D. S. in 1956 was 9924. Dentists joining the service are in contract with the local executive councils for their respective areas. Local dental committees have been set up by the profession and are responsible for the appointment of 3 members for each executive council as well as for maintaining contact between the dental profession and the executive councils.

Lists of dentists taking part in the service are available in post offices and executive council offices. There is no need to register with a dentist. Patients are free to choose a dentist just as the dentist is free to accept them or not. When it began the N. D. S. provided, free of charge, all forms of treatment necessary for the restoration of dental fitness, and all repairs and replacements which were not due to carelessness. In 1951, however, charges in part towards the cost of dentures were introduced, and in 1952 a charge towards the cost of treatment was also introduced. Examination remained free. The charge for treatment is the cost of that treatment up to £1. The charges for dentures are as follows: 1 to 3 teeth on one denture, £2; 4 to 8 teeth on one denture, £2 5s.; over 8 teeth on one denture, £2 10s. The maximum charge on 2 dentures is £4 5s. Treatment for expectant mothers and children is still provided free under the local authority dental service. Treatment falls into 2 main divisions—that which may be carried out without prior authority, and that which requires the prior authority of the Dental Estimates Board, consisting of a dental chairman, 6 dental members, and 2 lay members appointed by the minister of health. Treatment not needing prior authority includes all normal conservative treatment—i.e. prophylaxis, fillings and root treatment, extractions for the relief of pain or extractions not necessitating replacements by dentures (including any necessary anaesthetic), and ordinary denture repairs. X-ray examinations for diagnosis and certain other treatment may likewise be carried out at once, subject to a limitation of cost. Treatment needing prior authority includes the removal of teeth otherwise than above, the provision of dentures, extensive and prolonged treatment of the gums, gold fillings, inlays, crowns, special appliances, and oral surgery.

Where a dentist gives treatment in his own surgery, he is paid on a prescribed scale of fees based on items of treatment carried out by him. Apart from the patient's contribution payment is made by the executive council with whom the dentist is in contract. The scale of fees is based on the recommendations of the

Spens Committee (pub. May 1948). The main recommendations are these: (1) If there were sufficient dentists in relation to the demand for their services to secure a spread of incomes comparable to that in 1938, arrangements should be made to ensure that, between 35 and 54 years of age, three-quarters of those dentists should receive net incomes of over £850 a year, one-half should receive incomes of over £1100, and one-quarter incomes of over £1400. These amounts are related to 1938 value in money; the Spens Committee left it to others to translate them into 1948 values. (2) Until there are sufficient dentists to secure such a spread of incomes, a single-handed dentist using all appropriate assistance and working efficiently for 1500 hours a year at the chair-side, together with the hours necessarily spent outside the surgery, should receive a net income of £1600 (1938 values of money). Extra remuneration may be earned by experienced dentists under partnership agreements with junior partners or by employing salaried assistants; by dentists able to work more than 1500 chair-side hours a year without loss of efficiency; by dentists with special skill and experience acting as part-time consultants or specialists; and by dentists practising in especially unattractive areas. Under regulations made in 1949 any dentist earning more than a gross income of £4800 a year had his earnings above this amount cut by half. This restriction was removed after a few months and was replaced by an all-round 20 per cent reduction in the scale of fees. Another cut of 10 per cent on this scale was made in May 1950. This latter cut was removed in May 1955. Dentists in the N. D. S. and hospital dental officers received a 5 per cent increase in remuneration in May 1957.

**National Emblems.** The most familiar of N. E. are the flowers that have come to be identified with different countries. The rose has been England's flower since the 15th cent., when the land was divided by warring factions, the Yorkists choosing the white rose for their badge and the Lancastrians the red. The Scottish emblem of the thistle is said to date from the 8th cent., when a Dan. night assault on Stirling Castle was foiled because one of the attackers cried out as he trod on one. The leek is said to have been adopted as the emblem of Wales in Cadwallon's time, when the Welsh wore leeks in their caps to distinguish them from the Saxon invaders. St Patrick is credited with making Ireland's emblem the shamrock, which he used to illustrate the principle of the Trinity. The lily (fleur-de-lis) is the emblem of France, and the maple leaf of Canada.

There are also animal emblems, such as the Brit. lion, the Welsh dragon, and the Russian bear. The eagle has been the emblem of a number of countries. The U.S.A. chose the white-headed eagle, depicted with outspread wings and hence sometimes termed the spread-eagle. Austria, Prussia, and Russia have all used the eagle, usually the 2-headed eagle first

adopted by Charlemagne to symbolise the 2 main regions of his empire, and later taken to signify the union of the E. and W. empires. In addition there are accepted national personalities, John Bull standing for England, Uncle Sam for the U.S.A.

**National Film Archive**, official film archive of Great Britain for the permanent preservation of films and film records of all kinds. Films are chosen for preservation by a selection committee on two grounds: either their significance in the hist. of the film as a form of art and entertainment, or their value as historical records of events, manners, scientific discoveries, etc. The library is dependent on the voluntary co-operation of the film industry in presenting films, and does not enjoy the privilege of statutory deposit which the Brit. Museum, for example, has in respect of books. Research into the best technical methods of film preservation, and the cataloguing and indexing of its material, are two of the library's most important functions. It is associated with the Brit. Film Institute's distribution library, through which many of the most important films in the archive can be borrowed by schools, film societies, and other non-commercial educational bodies. The archive is a dept. of the Brit. Film Institute (q.v.) and a certain portion of the Institute's Treasury grant is allocated to its work.

**National Gallery, The**, London, contains the most important collection of pictures in the U.K. The building was erected in the classic style from designs by Wilkins, 1832-8, opened in 1838, and enlarged in 1860, 1876 (when a new wing was added by Barry at a cost of £80,000), and 1886; it stands on the N. side of Trafalgar Square. The nucleus of the collection was 38 pictures of John Julius Angerstein (d. 1823), a wealthy merchant of Russian extraction; his collection, one of the most famous in England, had been formed with the aid of his close friend, Sir Thomas Lawrence. At the suggestion of George IV this collection was purchased in 1824 by Parliament for £57,000, but, there being no place in which to exhibit the pictures, Angerstein's house was bought for the purpose. The Angerstein collection included the Hogarth series, 'Marriage à la Mode,' 1745; Wilkie's 'Village Festival,' 1811; 3 Claudes; Titian's 'Venus and Adonis,' 1554. The largest painting in the collection was Sebastiano del Piombo's 'Raising of Lazarus,' 1517-1519, and among other pictures acquired soon afterwards were Titian's 'Bacchus and Ariadne,' purchased in 1826; Annibale Carracci's 'Christ appearing to Peter,' 1626; Correggio's 'Vierge au Panier,' 1825; Reynolds's 'Holy Family'; Gainsborough's 'Market Cart'—these last two being presented by the Brit. Institution; Gainsborough's 'Watering Place'; and Copley's 'Death of Chatham.' Constable's 'Cornfield' was acquired in 1837 through a committee of friends and admirers of the painter. A considerable sum is voted annually by Parliament for augmenting the number of pictures, and

famous bequests include those of Beaumont (1826), Carr (1831), Olney (1837), Farnborough (1838), Vernon (1847), J. M. Turner (1856), Bell (1859), Peel (1871), Wynn Ellis (1876), Layard (1916), Salting (1916), Ludwig Mond (1924). The gallery is particularly rich in its masters and contains some of the best work of Raphael, Correggio, and Paolo Veronese. There are many important pictures of the early Sienese school, notably of Ugolino da Siena, and an exceptionally fine collection of pictures by the leading 15th-cent. painters, as Lippo Lippi, Signorelli, Uccello ('The Rout of San Romano'), Pollaiuolo ('Martyrdom of S. Sebastian'), and Pisano ('The Vision of St Eustace'). In the Venetian school the gallery is almost unrivalled with many of the outstanding works of Giovanni Bellini, Cima's 'Ecce Homo', Crivelli's 'Madonna and Child enthroned, surrounded by Saints', Lorenzo Lotto's 'Lucretia' (bought by the National Art-Collections Fund (q.v.) in 1927), Tiepolo's 'Finding of Moses', Tintoretto's 'The Origin of the Milky Way', and 'Vincenzo Morosini' (purchased through the National Art-Collections Fund and presented in commemoration of the National Gallery centenary, 1924), Titian's 'Venus and Adonis', 'Bacchus and Ariadne', 'Christ and the Magdalen: Noli me tangere', Paolo Veronese's 'Adoration of the Magi', and 'The Family of Darius before Alexander' (bought from Count V. Pisani in 1857 for £13,650). Canaletto and Guardi are handsomely represented with their views of Venice. Of the painters of the Umbrian school, Perugino is represented by the triptych 'The Madonna adoring the Child,' part of the altar-piece commissioned c. 1496 for the Certosa, Pavia; Piero della Francesca by 'The Baptism of Christ' and other panels; Raphael by 7 pictures, among them being 'S. Catherine of Alexandria', 'Vision of a Knight', 'Madonna, Child, and S. John', 'The Crucifixion'—a very early work (c. 1502) strongly influenced by Perugino (bequeathed to the gallery in 1924)—and the world-famous 'Ansidei Madonna', purchased from the Duke of Marlborough in 1885 for £70,000. The Parma school is represented by Parmigiano's 'Vision of S. Jerome,' and by sev. pictures of Correggio, including the very famous 'Mercury instructing Cupid before Venus' (purchased from the Londonderry collection, 1834). The earlier school of Bologna is represented by the 'Pietà' of Francia and the later by the 'Ecce Homo' and 'Adoration' of Guido and the work of Annibale Carracci, notably 'Erminia takes refuge with the Shepherds.' The gallery's one painting by Leonardo da Vinci is 'The Virgin of the Rocks,' of which there is an earlier version in the Louvre. The picture was purchased from the Earl of Suffolk in 1880. There are 2 pictures by Michelangelo—'The Entombment,' painted, apparently, c. 1495, and first recognised as by Michelangelo by Cornelius and Overbeck. It was bought from R. Macpherson, London, in 1868. The other picture is the 'Madonna and Child, S. John,

and Angels,' painted c. 1494 and perhaps the artist's earliest picture. It was purchased from Labouchère's executors in 1870. Among the most notable Ger. pictures are 'St Veronica' by Wm of Cologne, and Albrecht Dürer's 'The Painter's Father' (purchased 1904) and 'Portrait of a Senator.' The 'Duchess of Milan' by Holbein (the Younger) was purchased for the nation by the National Art-Collections Fund in 1909 from the Duke of Norfolk for £50,000. The same artist's 'The Ambassadors' was bought in 1890 from the Earl of Radnor with the aid of gifts from Lord Rothschild and Lord Iveagh.

The collection is rich in fine examples of early Flem. painting, notably the 'Arnolfini Marriage' by Jan van Eyck, while the 'Magdalen reading' by Rogier van der Weyden, the 'Exhumation of St Hubert' by Dierick Bouts, and 'The Adoration of the Kings' by Mabuse (Jan Gossnert) are admirable examples of the work of these painters. 'The Adoration of the Kings' by Pieter Brueghel was acquired through the National Art-Collections Fund and other funds in 1921. Equally well represented are the later Flem. painters: Rubens by some 30 or more pictures, including 'The Rape of the Sabinas,' 'Peace and War,' 'Triumph of Julius Caesar,' 'Susanna Fourment (known as 'Le Chapeau de Paille'), 'The Triumph of Silenus,' the 'Judgment of Paris,' bought in 1844, and the great landscape 'Château de Steen,' presented by Sir George Beaumont, 1826. Van Dyck is represented by many works, notably his 'Charles I,' which cost £17,500, and 'Lady and Child' (acquired in 1914). There is an equally full collection of great Dutch masters' paintings: Cuyp, with sev. pictures, mostly landscapes and riv. scenes; Frans Hals, portraits; Gerard van Honthorst, notably his 'Christ before Pilate'; Ostade, with 'The Alchemist,' 'Courtship,' and 'Man with a Jug'; Jan Steen, with 'The Music Master' and 'Skittle Players'; Vermeer of Delft, with 'Lady standing at the Virginals' and 'Lady seated at the Virginals.' There is a score of pictures of Rembrandt, notably 'The Philosopher,' 'Portrait of an Old Woman,' 'Adoration of the Shepherds,' 'Descent from the Cross,' 'The Woman taken in Adultery,' 'A Jew Merchant,' 'Portrait of Himself' (as an old man), 'Portrait of Margaret's Trip' (bought in 1899, a second picture of the same title being acquired in 1941), and 'Diana bathing.' Ruysdael's pictures include 'The Shore at Scheveningen' and sev. acquired through the Salting bequest. There are also sev. notable paintings by Ter Borch or Terburg, including 'The Guitar Lesson,' 'The Peace of Münster,' and 'Portrait of a Gentleman.' Of the Antwerp school, David Teniers the Younger is well represented by many pictures, which include 'An Old Woman Peeling a Pear,' 'Teniers's Château at Perck,' and 'The Village Fête.' Of the school of Amsterdam Hobbema is conspicuous with 'View of Middleharnis.'

Among the pictures of the Fr. school

are sev. landscapes by Claude (of Lorraine), notably 'Landscape: Death of Procris' and the great 'Seaports'—'Embarkation of the Queen of Sheba' and 'Embarkation of S. Ursula'; Nicolas Poussin is represented by 8 pictures, including 'Adoration of the Shepherds' (from the Victoria and Albert Museum in exchange for other works, 1895), 'Bacchanalian Festival,' and 'Bacchanalian Dance'; Chardin, by 'La Fontaine' and 'The Lesson'; Puvion de Chavannes, by 'Summer'; and Manet, by 'Soldier examining the Lock of his Rifle' (acquired 1918). Of the Sp. school the gallery possesses excellent portraits of Philip IV of Spain by Velazquez and another of that king hunting wild boar. 'The House of Martha' (of the first or Sevillian period) and the 'Venus and Cupid,' known as the 'Rokeby Venus,' in the possession of Olivarez in 1682, later in that of Godoy, and eventually acquired by the National Art-Collections Fund in 1906 for £45,000, are also by the Sp. master. The pictures of Murillo are not outstanding examples, but mention may be made of 'The Immaculate Conception' and 'St John the Baptist,' both acquired in 1924 by bequests. El Greco is adequately represented by 'The Agony in the Garden' and 'Christ driving the Traders from the Temple.' The 'Kneeling Friar' of Zurbaran is a specimen of that painter's work which is not rivalled either in or out of Spain, and also in the gallery are his 'A Franciscan' and 'A Lady as S. Margaret.'

The gallery is, naturally, very well provided with pictures by all the famous Brit. artists, but only a few representative works can be mentioned here: Constable, 'The Cornfield, or Country Lane,' 'The Hay-wain,' 'Flatford Mill,' and many other pictures from the Henry Vaughan and Salting bequests of 1900 and 1910 respectively; John Crome, 'Mousehold Heath'; Gainsborough, 'Mrs Siddons,' 'The Painter's Daughters,' 'Ralph Schomberg,' 'Sir William Blackstone,' and nearly a score of others; Sir Thomas Lawrence, 'Queen Charlotte' (acquired 1927); Millais, 'Ophelia'; Reynolds, 'The Graces, decorating Hymen' (bequeathed 1837), 'The Holy Family,' 'Self Portrait' (from the Peel collection), 'George, Third Duke of Marlborough and his Family,' 'Catherine, Lady Bampfylde,' and many others; Romney, 'Lady Hamilton'—a popular picture—'The Beaumont Family,' and 'Lady and Child'; and Whistler, with 2 nocturnes and the 'Little White Girl.' There is a large collection of Turner's works acquired through the Turner bequest. The popular favourites include 'Dido building Carthage,' 'The Sun rising through Vapour' (these two the artist stipulated to be hung near the Claudes), 'Ulysses deriding Polyphemus,' 'The Fighting Temeraire,' 'Venice: the Bridge of Sighs,' and 'Yacht Racing in the Solent.'

Acquisitions of this cent. include the following pictures: Gerard Ter Borch, 'Portrait of a Lady' (bequeathed by Sir

Otto Beit, 1931; Jan Liss, 'Judith and Holofernes' (presented 1931); a portrait of Dr Johnson, described as 'from the studio of Sir Joshua Reynolds' (presented in 1930); and 'The Children of R. R. Graham, Esq.' by Hogarth (presented through the National Art-Collections Fund, 1934). The National Art-Collections Fund, by securing the Rokeby Velazquez, the Norfolk Holbein, and since then the 'Madonna and Child with Angels' of Masaccio (1916) and Tintoretto's 'Morosini' (1924), has taken the

schier, 'Portrait of a Lady' (1935); Ingres, 'Madame Moitessier seated' (1936); Alfred Sisley, 'A Landscape in Spring' (1936); Raeburn, 'Pringle Fraser' (portrait of a young man) (1937); D. G. Rossetti, 'The Girlhood of Mary Virgin' (1937); Filippino Lippi, 'Moses causes Water to flow from the Rock' (1937); Richard Wilson, 'The Thames near Marble Hill, Twickenham' (1937); Piero di Cosimo, 'The Battle of the Centaurs and the Lapiths' (panel) (1937); Degas, 'Combing the Hair' (1937); Peter de Wint, 'Har-



THE NATIONAL GALLERY, LONDON

*Mirrorpic*

foremost place amongst the private benefactors to the gallery. Other acquisitions through this fund include Titian, 'The Vendramin Family in adoration before a Reliquary of the True Cross' (1929); Richard Wilson, 'On Hounslow Heath' (1929); the 'Wilton Diptych' (1929); and Rubens, 'The Watering Place' (1936). Purchases or gifts in the decade immediately preceding the Second World War include Canaletto, 'Regatta on the Grand Canal, Venice' (bequeathed by Lord Revelstoke, 1929); Reynolds, 'Self Portrait' (bequeathed 1930); Gerard van Honthorst, 'St. Sebastian' (1930); Salvatore Rosa, 'Portrait of the Painter' (presented by the 6th Marquess of Lansdowne, 1933); Hoppner, portrait of 'Rt. Hon. Charles Long' (1934); Corot, 'Study of a Woman' (1934); Gainsborough, 'John, Tenth Viscount Kilmorey' (1934); Bernardo Cavallino, 'Purification of the Temple' (1935); J. S. Cotman, 'Seashore with Boats' (1935); Constable, 'Hadleigh Castle' (1935); Caspar Net-

vesters' (1937); Raffaellino del Garbo, 'Virgin and Child with Two Angels' and 'Virgin and Child with the Magdalen and St. Catherine of Alexandria' (1937); 4 panels ascribed to Giorgione (1937); Van Dyck, 'The Virgin and Child adored by the Abbé Scaglia' (1938); David Cox, 'The Welsh Funeral, Bettws-y-Coed' (1938). (See supplementary catalogue of the National Gallery, pub. 1939.)

Among other and more recent acquisitions may be mentioned the following: Géricault, 'Horse frightened by Lightning' (acquired 1938); Rembrandt, 'Flora' (1938); Zoffany, 'Mrs Oswald' (1938); Reynolds, 'Admiral Kingsmill' (1939); Lorenzo Monaco, 'Legend of St Benedict' (1940); Metsu, 'Lady drawing' (1940); Dosso Dossi, 'Bacchanalian Scene' (1941); Niccolò dell'Abate, 'Landscape, with the Legend of Eurydice' (1941); Hogarth, 'The Staymaker' (1942); Pannini, 'Interior of St Peter's' (1942); Titian, 'Catherine Cornaro' (1942); Dutch 17th cent., 'Three Music-making Children'

(1943); 'The Visitation,' ascribed to Philippe de Champaigne (1944); Giovanni di Paolo, 'Four Scenes from Life of John Baptist' (purchased from executors of J. Pierpont Morgan, 1944); Venetian 16th cent., 'Landscape with Mythological Scene,' (1944); Nicolas Poussin, 'Annunciation' (1944); 'Virgin and Child with Angels,' ascribed to Benozzo Gozzoli (1945); Greuze, 'Mme Gléon' (1945); Largillierre, 'Monsieur Forest' (1945); Tiepolo, 'Deposition' (1945); Romney, 'Lady Hamilton,' his second portrait of her (1945); Dürer, 'Virgin and Child' (1945); J. F. Millot, 'Landscape with Storm' (1945); Portuguese school, 'Marriage of St. Catherine' (1945); ascribed to Sp. 18th cent., 'Old Man holding Bottle' (1945); Nicolas Poussin, 'Worship of Golden Calf' (1945); Flem. 17th cent., 'Portrait of Man in Black' (1945); Reynolds, 'Landscape' (presented by the National Art-Collections Fund, 1945); Mantegna, 'Imperator Mundi' (final part of Mond bequest, 1946; the Menline 'Triptych,' and a Rembrandt, both from Chatsworth.

Since then further works have been acquired, the most important of which are Nicolas Poussin, 'Landscape with a Snake,' Murillo, 'Christ at the Pool of Bethesda,' and 'Self Portrait'; Masolino, 'St. Jerome and John the Baptist'; Hobbema, 'The Herring-Packers' Tower, Amsterdam'; Cézanne, 'La Vieille au Chapelet'; Wilson, 'Holt Bridge, River Dee' and 'The Dee Valley'; Gainsborough, 'The Morning Walk.'

In 1930 the National Gallery was extended by the opening of new rooms for the exhibition of the work of the early It. masters, the cost being borne by Sir Joseph Duveen. Before the Second World War there were about 2000 pictures at the National Gallery. Of these not more than about 850 were hung on exhibition; but the remainder were accessible at any time to anyone who inquired of the head attendant. After the war only about 250 were exhibited (1946); but when the 2 larger galleries were reopened and other accommodation restored, about 400 were on view. When an adjoining site became vacant in 1958, the question of an extension was discussed. See Sir C. Holmes, *The National Gallery* (1. *Italian Schools*; 2. *Netherlands, Germany, and Spain*; 3. *France and England*), 1923-7; Sir C. Holmes and C. H. Collins Baker, *The Making of the National Gallery*, 1924; Sir K. Clark, *One Hundred Details from Pictures in the National Gallery*, 1938, and *More Details*, 1941; revised N. G. Catalogues of individual schools of painting by Martin Davies and others, 1946 to date; Sir Philip Hendy, *The National Gallery, London*, 1955; *The National Gallery, 1938-1954* (official pub.), 1955.

National Geographic Society, formed in the U.S.A. in 1888 by Gardiner Greene Hubbard, who held the presidency until his death in 1897. Existing for the 'increase and diffusion of geographic knowledge,' the N. G. S., in collaboration with the gov. and other public bodies, has

sponsored many expeditions. Amongst them were the Peary expedition to the N. Pole, the Byrd expeditions to the N. and S. Poles, and the Beebe expedition of 1934, 'man's deepest plunge' into the Atlantic, as well as expeditions into Peru, China, and New Mexico. The society's maps were extensively used by Brit. and Amer. military and naval authorities during the Second World War. From 1899 to 1954 the *National Geographic Magazine* was produced under the editorship of Gilbert Grosvenor, who was also president of the society from 1920 to 1954. It had a monthly circulation in 1956 of 2,200,000, one-sixth of it in Canada and abroad. The N. G. S. is not to be confused with the Amer. Geographical Society, U.S.A., counterpart of the Royal Geographical Society.

National Government (Great Britain), name given to the gov. which replaced the second Labour gov. in Aug. 1931, and which was made up of ministers drawn from all 3 political parties, with Ramsay MacDonald as Premier. The N. G. was formed to carry out a policy of retrenchment of expenditure so as not only to provide for the needs of the budget, but also to restore foreign confidence in the financial stability of Great Britain. The Cabinet comprised 10 members—4 Conservatives (Stanley Baldwin, Neville Chamberlain, Sir Samuel Hoare, and Sir Philip Cunliffe-Lister), 4 Labour (Ramsay MacDonald, Lord Sankey, Philip Snowden, and J. H. Thomas), and 2 Liberals (Earl of Reading and Sir Herbert Samuel). Arthur Henderson, who had been foreign secretary in the Labour gov., became leader of the Opposition. The newly formed Cabinet was to continue in office until means were provided to balance the budget and the crisis passed, when a general election would take place. When confidence in the pound had been restored at home and abroad (Oct.) the N. G. appealed to the nation, asking for a 'doctor's mandate' to do whatever was necessary to secure financial and economic stability. The N. G. obtained the record majority of nearly 500—the Labour opposition being almost wiped out. The gov. was, in effect, a Conservative gov., though MacDonald remained its Prime Minister until 1935. In Nov. 1935 a second so-called 'N. G.' was returned, again with a very large majority. The gov. remained nominally a N. G. until 1940, when it was reconstituted under Winston Churchill as a Coalition gov., including a number of leading Labour and Liberal members, which was more truly 'national' than the so-called N. G. it replaced.

National Grid, Brit. system of map-reference instituted after a recommendation by the Davidson Departmental Committee of 1935-8. From the central meridian are laid out squares with sides at right angles and parallel to it respectively, which are multiples of the international metre. Thus there can be found for every point a map reference peculiar to itself consisting of the rectangular co-ordinates of the point measured

eastwards and northwards. The kilometre reference consists of 2 letters showing the square with 100 km. sides followed by 2 pairs of figures showing the square with 1 km. sides, e.g. SU/2666. The initial point from which measurements are made has been arbitrarily fixed at a point to the SW. of the Scilly Is. The scale of the map does not affect the reference, though since with the larger scales more digits can be included, greater accuracy is thereby achieved. A sheet line system related to the grid links the various scales by allowing the smaller to be used as indexes to the larger. The N. G. system has proved of very great value in many fields of activity: in local gov., for keeping records and statistics, for describing sites, for police work, and so on. The War Office have replaced their military grid by the N. G.

**National Guard**, name given to an armed force of citizens organised for local defence. The term is applied particularly to the Fr. *garde bourgeoise*, which was enrolled at the time of the revolution. The National Assembly proclaimed in 1790 the principle of a compulsory and universal service, to which all qualified citizens belonged, and membership of which was in most cases a necessary corollary of the full rights of citizenship. The N. G. was not abolished until 1872. Local forces in Spain, Italy, etc., and organised militia in all parts of the U.S.A., are also called N. G.s. See also MILITIA.

**National Health Service**. This was inaugurated on 5 July 1948, under the National Health Service Act (1946), 'to promote the establishment in England and Wales of a comprehensive health service designed to secure improvement in the mental and physical health of the people . . . and the prevention, diagnosis, and treatment of illness.' Separate Acts provide for Scotland and N. Ireland. The scheme was evolved from proposals pub. in a White Paper in 1944. Everyone is entitled to use the service and no insurance qualification is necessary. The main heads: (1) General Medical and Dental Services, Pharmaceutical Services, Supplementary Ophthalmic Service; (2) Hospital and Consultant Service; (3) Local Health Authority Services.

1. **GENERAL MEDICAL SERVICES**. Regional executive councils, whose members serve in a voluntary capacity, are responsible for the organisation of the family doctor service, the dental, pharmaceutical, and supplementary ophthalmic services. All doctors are entitled to take part in the family doctor service and about 19,500 do so in England and Wales alone. By doing so they are not precluded from also having private fee-paying patients. General practitioners are paid on a capitation basis (see below). Everyone over 16 years of age may choose his or her own doctor. People away from home can be treated by another doctor as 'temporary residents.' Any doctor who joined the service by 5 July 1948 was free to continue practising where he was, but doctors joining the service subsequently must first obtain

permission from the Medical Practices Committee; such permission is given unless the number of doctors in the area concerned is already considered to be sufficient. Doctors may prescribe for their patients all drugs necessary for treatment and a certain number of surgical appliances. Hearing aids are provided free to those needing them. Drugs and medicines were formerly free, but in June 1952 a charge of 1s. was made in respect of each prescription form made out by the family doctor except in certain cases of hardship, and in Dec. 1956 this was amended to 1s. an item instead of 1s. a form. Almost all chemists in the country have joined the service.

**Dental Service**. Like doctors, dentists are free to take part in the service or not, as they wish; about 97 per cent have done so. Patients do not need to register with a particular dentist for the dental service, as is the case with the family doctor service. Instead of a capitation fee the dentist receives payment for each item of treatment. All normal conservative treatment can be carried out by the dentist without prior approval, but such approval is required before treatment involving the removal of teeth necessitating replacement by dentures, provision of dentures, gold fillings, and other expensive forms of treatment. In May 1951 charges towards the cost of dentures were introduced, and in June 1952 a charge of £1, or the full cost of treatment if less than £1, was put into force, patients under 21 years of age and necessitous persons being exempt (see NATIONAL DENTAL SERVICE).

Working in the **Supplementary Ophthalmic Service** are (a) ophthalmic medical practitioners, doctors who test sight and prescribe glasses; (b) dispensing opticians, who test sight, prescribe glasses, and supply them; and (c) dispensing opticians, who do not test sight but simply supply glasses to prescription. The first time a patient requires ophthalmic attention within the service (even if already wearing glasses) he must obtain from his doctor a form certifying that he needs a sight test. There is complete freedom of choice as to whom he may consult for this purpose. Formerly there were no charges except where a patient chose a more expensive spectacle frame than one of the standard frames approved for the service, or asked for special lenses when such were not essential. Since May 1952 charges to patients of 10s. for each lens plus the actual cost of the frames have been in force, with exemption for necessitous persons; children's glasses in the standard type of frame are free.

2. **HOSPITAL AND CONSULTANT SERVICE**. On 5 July 1948 most voluntary and municipal hospitals (including mental hospitals, mental deficiency institutions, convalescent homes, and certain clinics) passed into the ownership of the minister of health. A few hospitals, mostly those being run by religious orders, were not taken over; these are termed 'disclaimed hospitals.' The hospital service includes general and special hospitals, specialist

opinions and treatment, convalescent treatment, and all forms of specialised therapy. Hospitals are organised by regional hospital boards and day-to-day administration is carried out by hospital management committees (usually responsible for a group of closely related hospitals). The teaching hospitals, however, are outside the immediate responsibility of regional boards and are administered by boards of governors. Specialists and consultants who take part in the service hold whole-time or part-time hospital appointments. They, and resident hospital medical officers, are paid a salary (see HOSPITAL).

3. LOCAL HEALTH AUTHORITY SERVICES are the responsibility of the local health authorities, i.e. co. councils and co. bor. councils. They provide such services as midwifery, antenatal, postnatal, and child welfare clinics (see MATERNITY AND CHILD WELFARE), health visiting, home nursing, ambulances, local mental health services, vaccination, immunisation, and domestic help on health grounds. All but the last are free, but since 1952 local health authorities are empowered to make charges for the use of day nurseries. They may also make approved arrangements for the prevention of illness and the care and after-care of the sick. This may include the provision of special foods and special accommodation for invalids and convalescents, and the making of grants to voluntary organisations doing work of this kind.

*Remuneration of the doctor.* The main payments come from a central pool, based on the number of doctors taking part in the service and amounting at present to £50,000,000 annually. A capitation fee is paid to the doctor in respect of each patient on his list; at present this is 17s. per head per annum. The maximum number of patients which a general practitioner may accept on his list is 3500 if single-handed, 4500 for a member of a partnership provided the average for the partnership is not above 3500, and in addition 2000 in respect of the employment of a permanent assistant. There is an additional payment of 10s. per annum for every patient from 501 to 1500 on the doctor's list. An initial practice allowance is payable to doctors setting up in practice single-handed; this is £600 in the first year, £450 in the second year, and £200 in the third year. Other provisions include mileage payments for visiting distant patients on the doctor's list, payments for the treatment of temporary patients, payments to encourage doctors to practise in unpopular areas, maternity, vaccination, and immunisation fees. Practitioners who were in practice before the commencement of the service in 1948 are not entitled to sell the goodwill of their practice, but are entitled to compensation for the loss of this right. Such compensation is not normally payable until the doctor dies or retires; meanwhile he receives interest at 2½ per cent on the unpaid compensation money. A superannuation service is also available for doctors in the service.

*Efficient service.* The Act provides for special tribunals to investigate cases where it is claimed that the continued inclusion of any doctor, dentist, chemist, or optician in the lists drawn up by the executive councils would be prejudicial to the efficiency of the service. The tribunal has a legal chairman appointed by the Lord Chancellor and includes a member of the same profession as the person whose case is being investigated and one other, the latter two being appointed by the minister of health.

About 50 million persons are covered by the service in Great Britain and N. Ireland and the ann. expenditure is approximately £500 million. For N. H. S. contributions see NATIONAL INSURANCE ACT (1946). See C. Hill and J. Woodcock, *The National Health Service, 1949*; the special number of the *Practitioner*, 1949; J. S. Ross, *The National Health Service in Great Britain*, 1952.

*National Ideology, see IDEOLOGY.*

National Insurance Act (1946) gives legislative form to the all-embracing scheme of social insurance which first took shape in the Beveridge Report of 1942 and was developed in the White Paper pub. in Sept. 1944 (see SOCIAL INSURANCE). The Act provides payment by way of unemployment, sickness, and maternity benefit; retirement pension; widow's benefit; guardian's allowance; and death grant. It repeals all existing enactments relating to unemployment insurance, national health insurance, widows' and orphans' and old age contributory pensions, and non-contributory pensions; and it provides for payments towards the cost of the National Health Service (q.v.). The main benefits and grants payable were revised in the National Insurance (No. 2) Act, 1957, and are as follows:

Sickness and unemployment: 50s. with 30s. for a dependant and 15s. for first child and 7s. for each other child.

Retirement pensions: 50s., except where the pension is payable to a woman by virtue of her husband's insurance and he is alive.

Widow's allowance: 70s. (for 13 weeks following death of husband) with 20s. for first child and 12s. for each other child.

Widowed mother's allowance: 70s., plus 12s. for each child after the first.

Widow's pension: 50s.

Guardian's allowance: 27s. 6d.

Maternity allowance: 50s. (for 18 weeks).

Maternity grant: £12 10s.

Home confinement grant: £5.

Death grant for adults: £25.

The main contribution rates defined in the National Insurance (No. 2) Act, 1957, and the National Health Service Contributions Act, 1958, are set out in the tables on p. 73.

Generally contributions are paid by means of stamps on a single insurance card. For an employed person the stamp covers industrial injuries insurance as well as insurance under this Act, and the responsibility for paying contributions rests on the employer, but he can deduct the employee's share from his wages,



Combined National Insurance and National Health contribution rates as from 7 July 1958, including industrial injuries contributions.

## MAIN RATES OF COMBINED WEEKLY CONTRIBUTIONS

Class 1. Employed Persons				
Men		Women		
	Age 18 or over	Age under 18	Age 18 or over	Age under 18
<i>Paid by employee</i>	9s. 11d.	5s. 5d.	8s. 0d.	4s. 8d.
<i>Paid by employer</i>	8s. 3d.	4s. 11d.	6s. 9d.	4s. 0d.
<i>Total</i>	18s. 2d.	10s. 4d.	14s. 9d.	8s. 8d.

Class 2. Self-employed Persons			
Men		Women	
Age 18 or over	Age under 18	Age 18 or over	Age under 18
12s. 0d.	6s. 9d.	10s. 0d.	5s. 11d.

Class 3. Non-employed Persons			
Men		Women	
Age 18 or over	Age under 18	Age 18 or over	Age under 18
9s. 7d.	5s. 5d.	7s. 7d.	4s. 6d.

## EXCHEQUER SUPPLEMENT

Description of person by or in respect of whom contribution is paid	Amount of Supplement			
	For contribution as employed person	For employer's contribution	For contribution as self-employed person	For contribution as non-employed person
<i>Men over the age of 18</i>	s. d. 1 3	s. d. 1 2	s. d. 3 3	s. d. 2 6
<i>Women over the age of 18</i>	1 0	1 0	2 0	2 0
<i>Boys under the age of 18</i>	8	8	1 10½	1 5
<i>Girls under the age of 18</i>	7	7	1 7	1 1

provided the deduction is made on the day the wages are paid. Exemptions from payment of contributions apply to persons who are unemployed or incapable of work, and also to other classes of persons such as married women, widows, and self-employed and non-employed persons whose income does not exceed £156 per annum. There are also special provisions relating to students, unpaid apprentices, and persons coming into the country from abroad.

The central administrative body which administers the Act is the Ministry of Pensions and National Insurance, which has regional and local offices throughout the country.

**Contribution conditions.** For unemployment or for sickness benefit: (a) 26 contributions (for unemployment these must be Class I, and for sickness, Class I or Class II) paid between entry into insurance and

the day for which benefit is claimed; and (b) not less than 50 contributions (as above) paid or credited in respect of the last complete contribution year before the beginning of the benefit year. For maternity grant: not less than 26 contributions (Class I, II, or III) paid between entry into insurance and day of confinement and not less than 26 paid or credited in respect of the last complete contribution year before confinement. For maternity allowance: not less than 50 Class I or II contributions paid by or credited to claimant in respect of the 52 weeks immediately preceding the 13th week before the expected week of confinement and, of those contributions, not less than 26 to be Class I or Class II contributions actually paid. Widows' benefit or retirement pension: not less than 156 contributions paid in the period between entry

into insurance and the date of reaching pensionable age or death under that age, and a yearly average of contributions paid or credited of not less than 50. For death grant: not less than 26 contributions paid or credited between 5 July 1948 and deceased's death or date of attaining pensionable age, if earlier. Also, not less than 45 contributions paid or credited in the last complete contribution year or a yearly average of 54 contributions paid or credited.

**Sickness and unemployment benefit.** Employed persons can qualify for either; self-employed persons for sickness benefit only.

**Rates.** Sickness benefit or unemployment benefit for a man or single woman over 18 is 50s. weekly. Unemployment benefit for a married woman over 18 is 50s. weekly. Sickness benefit for a married woman over 18 is 50s. weekly.

Increase of benefit (i.e. sickness, unemployment, or maternity allowance) for wife or adult dependant is 30s. weekly.

Increase of benefit for children is 15s. for first child and 7s. for each additional child.

A married woman over 18 receives the same rate as a single woman if she is supporting an invalid husband, or if she is not living with her husband and cannot obtain any financial help from him.

**Duration of benefit.** During the same spell of absence from work an insured person can draw: (a) sickness benefit without limitation of period if he has paid at least 156 contributions at any time; (b) 180 days of unemployment benefit, together with additional days of benefit, assessed on his record of contributions and benefit. Two spells of absence from work count as one if not separated by more than 13 weeks. When an insured person has exhausted his right to benefit of either kind he can requalify for that benefit when he has paid 13 more contributions. Contributions must be Class I for unemployment benefit and Class I or II for sickness benefit. Disqualifications: refusing an offer of suitable employment; in the case of sickness benefit, failing to comply with rules of behaviour. Claims for benefit must be made promptly to avoid penalty imposed by regulations.

**Maternity benefits.** For a confinement a woman will receive a *maternity grant* of £12 10s. for each child born at the confinement, on her husband's insurance or on her own. *Home confinement grant* of £5 may also be payable for confinements at home or (in certain circumstances) in hospital. For a woman who ordinarily follows a gainful occupation there is in addition a maternity allowance of 50s. weekly for 18 weeks beginning with the eleventh week before the expected week of confinement provided she abstains from work.

**Widows' benefits.** A widow will qualify on her husband's insurance for an allowance of 70s. weekly for 13 weeks, with increases of 20s. for the first child and 12s. for each other child. Thereafter she will receive a widowed mother's

allowance of 70s. weekly, with increases of 12s. for each child other than the first. (Widowed mother's allowance (personal) of 40s. weekly is payable to a widow having a young person under 18—not at school or an apprentice—living with her or maintained by her to the extent of 16s. 6d. per week.) If she is over 40 when this allowance ceases and 3 years have elapsed since the date of her marriage, she will qualify for a widow's pension of 50s. per week. A widow who is left without any children of school age will receive a widow's pension of 50s. after the period of her widow's allowance, if she had reached the age of 50 when her husband died, provided that 3 years had elapsed since the date of her marriage. If, by reason of mental or physical infirmity, a widow is incapable of self-support at the time when her widow's allowance ceases, she will receive sickness benefit of 50s. so long as she is incapable of self-support. A widow whose husband had qualified for retirement pension before his death will receive the ordinary widow's benefits as above specified, if she is then under 60. If she is over 60, any retirement pension which she is already receiving will be raised to the single person's rate.

Reduction on account of earnings:

(a) Widow's pension: 6d. deducted for each complete 1s. of earnings between 50s. and 70s., and 1s. deducted for each complete 1s. over 70s.

(b) Widowed mother's allowance: 6d. deducted for each complete 1s. of earnings between 60s. and 80s. and 1s. deducted for each complete 1s. over 80s.; but the allowance cannot be reduced by more than 50s. however much she earns.

**Guardian's allowances.** Where the parents (including step-parents) of a child are dead, and one at least of them was insured under the scheme estab. by this Act, anyone who has the child in his family will qualify for a guardian's allowance of 27s. 6d. a week. There is statutory power to extend the allowance to cover certain cases excluded from the previous scheme.

**Retirement pensions.** An insured person who (a) has reached pension age (65 for a man and 60 for a woman); (b) has retired from regular employment; and (c) has paid the prescribed number of contributions will receive a retirement pension for life at the rate of 50s. a week. Men aged 70 and over, and women aged 65 and over, do not have to satisfy condition (b). Where a man aged 65 to 70, or a woman aged 60 to 65, does any work after having qualified and having been paid pension, 6d. is deducted for each complete 1s. of earnings between 50s. and 70s. and 1s. deducted for each complete 1s. over 70s. Where the insured person postpones his retirement beyond pension age, his pension, when he qualifies for it, will be increased by 1s. 6d. for every 25 contributions in the 5 years after pensionable age. *Wives:* If a pensioner has a wife under the age of 60, either living with him or mainly maintained by him, he will get an extra 30s. a week for her, provided she is

not gainfully occupied. When a man qualifies for pension, his wife, if she has reached 60, will be entitled to a separate pension on his insurance. The basic rate for the pension will be 30s. a week, but it will be increased by 1s. a week for every 25 contributions the husband pays after he has reached 65 and she has reached 60. A wife insured in her own right can draw retirement pension on her own insurance, even though her husband has not retired. *Widows:* A widow will qualify on her late husband's insurance for a retirement pension of 50s. a week if, immediately before reaching 60, she was drawing one or other of the various widow's benefits under this Act.

*Non-contributory pensions.* Anyone who had reached 55 years of age when the new pensions under this Act began to be paid will qualify, subject to his means, for a non-contributory pension on reaching 70, if he or she is not qualified for a retirement pension.

*Death grant.* This grant is payable for the expenses connected with the death of an insured person or with the death of his wife, or child, or widow. Where the insured person is a woman a grant is payable on the death of her husband or child. The grant is £25 for an adult; £18 15s. for a child aged 6 to 18; £12 10s. for a child aged 3 to 6; £7 10s. for a child under 3.

*Income and expenditure.* Actual expenditure on benefits in 1954-5 financial year and estimated expenditure in 1959-1960, 1969-70, and 1979-80 (amounts in £ millions):

Benefits	1954-5	1959-60	1969-70	1979-80
Retirement pensions	348	430	558	665
Widow's benefits and guardian's allowances	32	37	38	34
Unemployment benefit	16	59	62	61
Sickness benefit	84	95	104	102
Maternity benefits	13	12	12	12
Death grant	3	4	7	11
Cost of administration	26	28	29	30
Totals	522	665	810	915

Income of the National Insurance Fund in 1954-5 was as follows (amounts in £ millions):

Contributions by employers and insured persons	489
Exchequer supplement	71
Interest on investments of National Insurance Fund and National Insurance (Reserve) Fund	52
Total	612

**National Insurance (Industrial Injuries) Act, 1946, see WORKMEN'S COMPENSATION.**

National Liberal Club provides a central, convenient, and inexpensive club in London for Liberals and their friends throughout the kingdom. It was opened in 1887, is pleasantly situated on the Thames Embankment near Charing Cross station, and houses the Gladstone Library of 40,000 books, mainly political and sociological.

**National Maritime Museum, Greenwich, London, founded by Sir Geoffrey Callender**

and estab. by Act of Parliament in 1934. The museum buildings include the Queen's House designed by Inigo Jones (completed in 1635) (see GREENWICH). The collection gives a conspectus of the maritime hist. of Britain, in part by exhibits showing the development of the sciences of ship-building and navigation, nautical books, charts, instruments, etc., and in part by marine paintings, portraits, and contemporary ship models of considerable artistic interest.

**National Parks.** The term national park is variously used in different countries. The accepted definition in Great Britain, drafted by the late John Dower in his report on N. P. (1945, Cmd 6628), reads: 'An extensive area of beautiful and relatively wild country in which, for the nation's benefit and by appropriate national decision and action, (a) the characteristic landscape beauty is strictly preserved, (b) access and facilities for public open-air enjoyment are amply provided, (c) wild life and buildings and places of architectural and historic interest are suitably protected, while (d) established farming use is effectively maintained.'

Under the National Parks and Access to the Countryside Act, 1949, the N. P. Commission was set up with powers to designate N. P. and areas of outstanding natural beauty in England and Wales, to guide the administration of N. P. by the park planning authorities, to propose long-distance footpath routes, to assert the claims of amenity in places where natural

beauty is endangered, and to provide information services. Ten N. P. were designated from 1951 onwards, and by 1957 all had been confirmed by the minister of housing and local gov. These are Peak Dist., 542 sq. m.; Lake Dist., 860 sq. m.; Snowdonia, 845 sq. m.; Dartmoor, 365 sq. m.; Pembrokeshire Coast, 225 sq. m.; N. Yorks Moors, 553 sq. m.; Yorks Dales, 680 sq. m.; Exmoor, 265 sq. m.; Northumberland, 398 sq. m.; and Brecon Beacons, 515 sq. m.

*Administration.* The N. P. are administered by planning boards or committees,

or joint advisory committees, representing one or more co. planning authorities, with a minority of members (normally one-third) appointed upon the recommendation of the minister after consulting the N. P. Commission. Their powers are exercised under the Town and Country Planning Acts (see TOWN AND COUNTRY PLANNING), and the National Parks Act, with a special direction under the National Parks Act to have regard to the needs of agriculture and forestry, and additional powers to provide accommodation, meals, camping sites, and parking grounds for visitors. They may acquire lands for these purposes, improve waterways, and co. or co. bor. councils may restrict road traffic. The National Parks Act enables the gov. to make grants for these and other purposes and for preserving and enhancing beauty in the parks.

*Nature reserves, etc.* The National Parks Act also empowers the Nature Conservancy, and local planning authorities in consultation with the conservancy, to declare areas as nature reserves, and gives powers for their control and management.

The N. P. Commission may designate areas of outstanding natural beauty; up to July 1958 five areas has been designated and confirmed: the Gower Peninsula, Llyn, the Quantock Hills, the Surrey Hills, and the Northumberland Coast. Areas had also been proposed in Cornwall, Dorset, Devon, Cannock Chase, Shropshire Hills, Malvern Hills, and the Sussex Downs. It was intended to add half a dozen areas a year.

*Long-distance routes.* Between 1951 and 1955 five long-distance footpaths were proposed and approved: the Pennine Way, 250 m.; two Cornish coast paths, 135 m. and 133 m.; Pembrokeshire coast path, 150 m.; and Offa's Dyke, 168 m. Others are planned for coasts in Devon, Somerset, Dorset, Yorks, and for the S. Downs and Welsh Highlands. By 1958 rights of way were available for the greater part of the first five routes, but for certain portions negotiations were still proceeding.

Despite the progress achieved, enthusiasts urge that much has still to be done for users of the paths and N. P. Some farmers and lovers of quiet places, on the other hand, stress the damage done by inconsiderate visitors, and plead for more education of the public in behaviour. To achieve this the commission run a continuing campaign based on the *country code*.

*National parks abroad.* Many other countries have national and state parks and nature reserves, often of huge extent and nationally owned as well as controlled, and some reserved wholly from development. The world's first, Yellowstone Park in U.S.A. (1872), is over 3000 sq. m.; some other famous U.S. reserves are the Yosemite, Glacier, Grand Canyon, Mt Rainier, Sequoia, and Rocky Mt Parks. The U.S. Federal Parks alone extend to 34,000 sq. m. and are visited by 50 million annually. Canada also has immense mt parks, among them Banff (1885), Kootenay, Glacier, Yoho, Mt Revelstoke, and the Selkirk; Jasper, the largest, is of 4200 sq. m. Argentina's

largest, the Nahuel Huapi Park, has 3000 sq. m. In S. Africa the greatest are the Kruger National Park, of 8000 sq. m., and the Kalahari Gemsbok game reserve of 3000 sq. m. Kenya, the Belgian Congo, and other parts of central Africa have vast mt and wild life reserves. Japan's 19 N. P. (7000 sq. m.), 14 nature reserves (1600 sq. m.), and historic 'national gardens' are visited by 40 million a year. Soviet Russia's 40 nature reserves (5600 sq. m.) are devoted mainly to scientific and educational purposes. Spain puts its accent on mt parks for tourists, and on



*Australian News and Information Bureau*

PORT HACKING NATIONAL PARK,  
NEW SOUTH WALES

The Prince's Highway, Bull's Pass, near  
Sydney.

hunting and fishing interests; the Netherlands on natural reserves for recreation; Poland on its great mt and forest parks; Turkey on forests; and Belgium on small reserves of distinctive geological and biological character. There are also N. P. or reserves in Germany, Italy, Sweden, and Switzerland. The Australian states and New Zealand have many N. P. The Rep. of Ireland owns a state park in Killarney and a number of state fisheries. Scotland has as yet (1958) no N. P., but the Forestry Commission has declared certain areas to be 'National Forest Parks.' See *Town and Country Planning*, Aug. 1956 (National Parks issue); *Report of Committee on National Parks* (England and Wales) (Cmd 7121), 1947; Ditto (for Scotland), 1947; *Annual Reports of National Parks Commission*, 1950 on; *Annual Reports of Nature Conservancy*, 1952 on; also R. N. Hutchins, *National Parks and Access to the Countryside Act*, 1949, and

Norman Browning, *National Parks and Access to the Countryside*, 1950.

**National Physical Laboratory**, opened in 1900, managed by an executive committee and general board, but under the ultimate control of the Royal Society, with the object of assisting industries, research, etc. It is now a research estab. of the dept of Scientific and Industrial Research at Teddington, Middx. There are 9 main divs.: (1) Physics; (2) Light; (3) Electricity; (4) Control Mechanisms and Electronics; (5) Metrology; (6) Mathematics; (7) Aerodynamics; (8) Metallurgy; (9) Ship. A list of all papers pub. by the laboratory on the results of researches is issued quarterly. See SCIENTIFIC AND INDUSTRIAL RESEARCH.

**National Playing Fields Association**, founded 1925. Aims and objects: (1) To secure adequate public playing fields for the present and future needs of all sections of the community. (2) To secure properly equipped playgrounds for the use of children. (3) To co-operate in saving threatened recreational facilities. (4) To act as a centre of advice for local authorities and interested persons on all matters connected with the acquisition, lay-out, and use of grounds set apart for the playing of games. (5) To encourage local authorities to make the fullest use of their powers when preparing town-planning schemes to ensure that ample open spaces are secured, and that when slum clearance schemes are initiated children's playgrounds shall be provided. (6) To encourage physical recreation, and to ensure that the fullest use is made of all recreation grounds. (7) To encourage the training and appointment of play leaders and coaches. (8) To encourage all members of the community to make the right use of leisure hours. The Duke of Edinburgh is president of the N.P.F.A.

**National Portrait Gallery**, London, first of its kind and unrivalled in the world, was founded in 1856, estab. at S. Kensington in 1869, and finally moved to the present building to the N.E. of the National Gallery in 1898. A much-needed extension was made possible in 1931 through the generosity of Lord (then Sir Joseph) Duveen. Its chief feature is the collection of portraits of Brit. historical characters, the upper rooms containing portraits, arranged chronologically, of the sovereigns from Richard II, Chaucer, Shakespeare, Cromwell, and the 2 Pretenders; while the lower rooms contain portraits of celebrated statesmen, divines, writers, artists, and others. Among its treasures may be mentioned the 'Chandos' portrait of Shakespeare, and among its later acquisitions (1945) the series of 'Kit-Cat' portraits of famous Augustans painted by Kneller. There are specimens of Van Dyck, Reynolds, Gainsborough, Romney, Raeburn, Lawrence, and G. F. Watts. Photographs are not included, but the National Photographic Record (1917 to date) is housed in the same building. There is an admirable catalogue by the first director, Sir George Scharf, K.C.B. (1820-95), with more recent revisions, and a supplement pub. in 1954. For the

Scottish National Portrait Gallery see EDINBURGH.

**National Provincial Bank Ltd**, one of the 'big five' Brit. joint-stock banks, estab. in 1833, the first branch being opened at Gloucester in 1834. On 10 Jan. 1866 the bank started to do banking business in London, and sacrificed, by this step, its right to issue its own notes. In 1874 the institution was registered as an unlimited company under the Companies Acts, but on 8 April 1880 it was decided to register the bank as a limited liability company. In 1918 amalgamations were made with the Union of London and Smiths Bank and the Bradford Dist. Bank. In the following year the Sheffield Banking Company was also absorbed and sev. other banks have been taken over since the First World War. The head office of the bank is at 15 Bishopsgate, London, E.C.2.

**National Register**, census of Great Britain, taken on 15 Aug. 1915 and 29 Sept. 1939 to facilitate the best use of manpower in war-time and operated in conjunction with food rationing.

**National Research Development Corporation** was set up by the Development of Inventions Act which was passed 30 July 1948. An object of the Act is to secure to Brit. industry the benefits of inventions and discoveries by Brit. scientists. The corporation's functions are (a) to secure, where the public interest requires it, the development or exploitation of inventions resulting from research by gov. and other publicly financed organisations, and any other inventions which it considers are not being sufficiently developed or exploited; and (b) to accept, acquire, and hold rights in inventions (including new processes and techniques) and to grant or dispose of such rights for consideration or otherwise. The corporation, which in its work must comply with the general directions of the Board of Trade, has no special powers of acquiring patents, i.e. it cannot compel private firms owning patents to sell them, and inventors are in the same legal relations to it as to any other third party. The Board of Trade may advance to the corporation (within 10 years of its estab.) up to £5,000,000 for working capital. The corporation may borrow temporarily up to £250,000 for general or specific purposes, whilst if it is asked by a gov. dept. in the public interest, to carry out a project which results in a loss, the latter may be recouped out of public funds.

**National Rifle Association**, founded in 1860, and incorporated by royal charter in 1890, to encourage rifle shooting in the queen's dominions. From 1860 to 1889 meetings were held at Wimbledon, after which they were held at Bisley. The first shot at the first meeting at Wimbledon was fired by Queen Victoria from a Whitworth muzzle-loading rifle. The competitions at Bisley attract marksmen from all parts of the world. For particulars as to prizes, range, etc., see RIFLE SHOOTING. The offices of the association are at Bisley Camp, Brookwood, Woking, Surrey.

**National Savings Certificates**, first issued in Feb. 1916, to raise money for the First World War, since when there have been sev. later issues and one conversion issue. The first issue was at the cost price of 15s. 6d. each certificate, with a maturity value of 26s. after 10 years and interest at 1d. a month after the tenth year; the price of the other issues was 16s., excepting the sixth and seventh which were 15s., and the period 10 years for the second, third, conversion, and sixth and seventh issues, 11 years for the fourth issue, and 12 years for the fifth issue. Maturity values were, for the first and second issues, 26s., 24s. for the third issue, conversion issue, 24s., fourth and fifth issues, 23s., sixth issue, 20s., seventh issue, 20s. 6d., and eighth issue, 13s.

The amount remaining (principal plus interest) increased only very slowly after the Second World War from £1900 m. in 1946 to £2400 m. in 1955. During this period personal income increased by some two-thirds. The rate of interest on N. S. C. followed prevailing rates of interest when the bank rate was raised in 1951. But the rate of interest is probably not a dominant factor influencing the amount invested; the more important ones are security of capital value and liquidity. In a period of inflation, capital values were not secure and liquidity was a source of weakness, since N. S. C. were encashed more readily than other less liquid forms of investment.

**National Security Council, U.S.A.**, estab. by the National Security Act of 1947, and amended by the National Security Act Amendments of 1949 and the Mutual Security Act of 1951. Its purpose is to advise the president concerning the integration of domestic, foreign, and military policies relating to the national security, so as to secure more efficient co-operation between the military services and the other depts and agencies of the gov. on matters involving the national security. The council is composed of the president, vice-president, secretary of state, secretary of defence, director of the foreign operations administration, and director of the office of defence mobilisation. The Central Intelligence Agency is under the direction of the council, and the operations co-ordinating board also reports to the council.

**National Socialism**, Ger. nationalist movement led by Adolf Hitler (q.v.). Hitler's party was founded at Munich by Drexler in 1919 as the Ger. Labour party and renamed the National Socialist Ger. Labour party by Hitler. In 1920 the party adopted a programme the chief aims of which included the union of all Germans, abrogation of the Versailles treaty, persons of Aryan blood only to be members of the nation, foreign nationals to be excluded from Germany, nationalisation of trusts, substitution of Ger. for Rom. law, nationalist education, and improvement of the nation's physique. Mainly the nationalist, as distinct from the Socialist, slogans were fulfilled, and from the year 1933, when Hitler came to power, no attempt at systematic socialism in

the traditional sense was made, though economic initiative and control passed entirely to the State, not out of regard for Socialist theory but in furtherance of the policy of rearmament. The Nazi (q.v.) party, the sole lawful political association in Germany, was based on the leadership principle and the party members had no rights in relation to the conduct of policy, which was the exclusive function of the 'Führer.' Subsidiary organisations of the party of a compulsory character were the Ger. Labour Front, comprising all employees, and the *Hilfjugend* (Hitler Youth), and the party also organised its own military forces, the S.A. (*Sturmabteilung* or storm troops) and S.S. (*Schutzstaffel*, protective squadron). After the S.A. purge of 30 June 1934 the S.S. or *elite* assumed greater importance in the party system. A party congress was generally held at Nuremberg every year. The original basis of the party lay in the lower middle class, which the Nazis promised to save from the ruin threatened by big business and the economic crisis; but while the small trader's business increased, he suffered from heavy taxation and price control, while, later, 'superfluous' small shops and businesses were closed down altogether and the idea of saving the most needy section of the middle class was soon abandoned.

See further under **HITLER**.

**National Sporting Club**, club for gentlemen interested in sporting and theatrical matters. It was started in 1891, and was long noted as the scene of the princely contests, both amateur and professional, in the boxing world. After the Second World War the club ceased to exist.

**National Stud**, Brit. state-sponsored racehorse breeding farm, founded by Lord Waverley in 1916 as a private stud, and presented by him to the nation. Its first centre was at Kildare, Rep. of Ireland, but in Oct. 1945 it was moved to Gillingham in Dorset. The N. S. is one of the princely centres of the bloodstock industry, and the finest possible racehorses are bred for both the home and foreign markets. Stamina and speed are carefully studied, and only horses with a long record of racing successes are kept for breeding. A stallion at the N. S., being national property can be used by any owner with a mare good enough to be mated with him, and the stud fee is appreciably lower than on a good private stud farm. Nominations to the more popular stallions are decided by ballot. The queen leases horses from the N. S. and pays the gov. one-third of any stake money she wins. Although nominally a non-profit-making concern, the N. S. shows an accumulated profit of £195,000 since its foundation.

**National Theatre (Britain)**. N. T.s have existed for many years in other European countries than Britain. The movement for a N. T. in Britain is a comparatively recent development, and the first plans for a N. T. to be built by public subscription were laid by Harley Granville-Barker (q.v.) and Wm Archer (q.v.) in 1903.

Seven years later this scheme was combined with another already in existence, to provide a national memorial to Shakespeare. The appeal then launched by the Shakespeare Memorial N. T. Committee attracted many distinguished supporters. The largest contribution was that of Sir Carl Meyer, who gave £70,000 towards the cost of building a theatre which it was hoped to open in 1916 in the tercentenary of Shakespeare's death, but this was prevented by the outbreak of war in 1914. In 1937 a site of one acre near the Victoria and Albert Museum was purchased. After the Second World War it was decided that the N. T. should be erected in a more central locality. The L.C.C. offered to exchange a site on the S. bank of the Thames for the site in S. Kensington and also to provide approaches and roadways to the centre. The Joint Council of the N. T. and the Old Vic then had at its disposal about £70,000, but it was estimated that a worthy memorial theatre would cost about £1,000,000. This sum being outside the range of the Joint Council, it was decided to ask Parliament to underwrite the project. The gov. accordingly introduced a 2-clause Bill to that effect (1949). The first clause provided that the Treasury might make a contribution not exceeding £1,000,000 towards erecting and equipping the theatre, and the second made provision for the appointment of trustees. The architects' plans provided for a building containing 2 theatres: one seating 1200 people and the other about 500. It was also intended by the gov. to organise N. T. tours throughout the country and overseas. The proposed N. T. is not to be looked upon solely as a memorial to Shakespeare, especially in view of the memorial theatre at Stratford-on-Avon; but rather as the first of a chain of living theatres throughout the country.

**National Trust.** The N. T. acquires lands and houses of historic or architectural interest to ensure their preservation. Founded in 1895 by Octavia Hill, Sir Robert Hunter, and Canon Rawnsley, its status was confirmed by the National Trust Act, 1907, and later Acts of 1919, 1937, and 1939 confirmed and increased its powers. Land or buildings given or bequeathed to the N. T., together with any endowment, are exempt from death duties; properties can only be accepted if they are self-supporting or accompanied by an endowment to make them so. Under the 'country house' scheme it is possible for donors or their descendants to continue to live in the house they have given to the N. T. The N. T. is administered by a president and a council of 50, partly elected and partly appointed by various representative bodies. There are 9 voluntary committees meeting regularly at the head office of the N. T. to deal with particular spheres of work, and over 100 local committees. The Trust is independent of the State and is not a gov. dept. It is a charity dependent on voluntary support and its main sources of revenue are endowments, legacies, donations, and members' subscriptions. Membership of

the N. T. is open to anyone; there is also a corporate membership scheme for companies and firms.

Many types of land and property are preserved by the N. T. One of its finest houses is Knole, in Kent, a combination of country home, Renaissance mansion, eccles. palace, and feudal manor house, given in 1946 by Lord Sackville. There are also Little Moreton, Cheshire, a fine specimen of 16th-cent. half-timbered work, Montacute in Somerset, Blickling Hall in Norfolk, with an estate of 4500 ac., and others. Castles include Bodiam (c. 1386), Tattershall (c. 1440), and Lindisfarne (1550). There are nearly 20 pre-Rom. and Rom. antiquities, including Chedworth Rom. villa and Hadrian's Wall; Lacock Abbey is a fine example of medieval architecture. Whole vills. have been placed under the Trust's care: the Holnicote estate alone includes Schworthy, Allerford, Bossington, and Luccombe. Tenants are found for more than 500 farms. Many miles of coast of England, Wales, and Ulster are owned or protected. There are mts such as Scafell Pike, moorlands such as the 12,240 ac. Holnicote estate, and valleys such as the 1250 ac. Dolmelynllyn estate on the Ffestiniog road. Ornithological reserves include the Farne Is. (Northumberland) purchased in 1924 by public subscription, the Calf of Man, and Wicken and Burwell Fens. In 1949 the N. T. undertook the care of gardens alone accepted on their merits, and a joint committee with the Royal Horticult. Society was set up for this purpose. The first garden so accepted was Hidcote in Glos. and others now include Sheffield Park and Nymans in Sussex, and Mt Stewart and Rowallane in N. Ireland. Bridges are also preserved, such as Stainforth Bridge in Yorks, Easing in Surrey, and sev. packhorse bridges in Somerset. The largest single estate belonging to the Trust is that of Penrhyn. It extends to 40,000 ac. and was given in 1951 by the Treasury who had accepted it in lieu of death duties. The H.Q. of the N. T. are at 42 Queen Anne's Gate, London, S.W.1; there is a separate N. T. for Scotland, and similar bodies have been instituted in other countries, including Rep. of Ireland, Belgium, U.S.A., Australia, and New Zealand.

**National Union of Mineworkers.** The, founded Jan. 1945 by the amalgamation of the trade unions previously affiliated with the Miners' Federation of Great Britain. This federation of coal miners' unions was estab. in 1888 with a membership of 36,000, and its political power received an impetus from Fr. ideas before the First World War, though the leaders of the great coal strike of 1912 were not syndicalist. Before the First World War the Federation's programme was nationalisation and state administration of mines, but after that war it was changed to a demand for national ownership coupled with democratic control by the workers. This programme of guild socialism was in fact presented before the Sankey Commission in 1919. Present-day membership totals over 669,000.

**National Union of Teachers (N.U.T.)**, official organisation of the members of the teaching profession engaged in state-provided primary and secondary schools and Institutes of further education; it may be termed the teachers' trade union. It was formed in 1870 and its chief objectives are: (1) To associate and unite the teachers of the kingdom of England and Wales. (2) To provide means for the co-operation of teachers and the expression of their collective opinion upon matters affecting the interests of education and the teaching profession. (3) To improve the conditions of education in this country, to obtain the estab. of a national system of education, and to secure for all public elementary schools adequate financial assistance and accommodation. (4) To afford to the Ministry of Education and

In the 1930's the growing philosophy of state control of economic affairs contributed to the success of collectivist propaganda. So also did the rapidity of Britain's progress towards 'rationalisation,' and a series of war-time or pre-war reports, e.g. the Sankey Commission Minority Report on coal-mining, the Royal Commission on Transport, the McGowan and Heyworth reports on electricity and gas. The State assumed control of the mines and the railways in both the world wars. The Labour Gov.'s Coal Mines Act of 1930 provided for price and output regulation to sustain the existing pattern of production. When the Labour party returned to power in 1945 it carried through a chain of N. measures in 9 Acts of Parliament within four and a half years:

	<i>Royal Assent</i>	<i>Testing Date</i>
1. Bank of England . . . . .	14 Feb. 1946	1 Mar. 1946
2. Civil Aviation . . . . .	1 Aug. 1946	1 Aug. 1946
3. Coal . . . . .	12 July 1946	1 Jan. 1947
4. Cable and Wireless (undertaken by Post Office)	6 Nov. 1946	1 Jan. 1947
5. Transport . . . . .	6 Aug. 1947	1 Jan. 1948
6. Land Development Rights (Town and Country Planning Act) . . . . .	6 Aug. 1947	1 July 1948
7. Electricity . . . . .	13 Aug. 1947	1 April 1949
8. Gas . . . . .	30 July 1948	1 May 1949
9. Iron and Steel . . . . .	24 Nov. 1949	15 Feb. 1951

other public or private organisations in connection with education the advice of the association. (5) To secure the effective representation of educational interests in Parliament. (6) To watch the working of the various Acts of Parliament in connection with education, and to secure the removal of abuses. (7) To raise the status of the teaching profession, and to open the highest posts in the education service of the country, including the inspectorate of schools, to the best equipped members of the union. The present membership is 225,000, being approximately 80 per cent of the total number of teachers. The offices are at Hamilton House, Mabledon Place, W.C.1. See *The Yearly Handbook and Account of the Conference Proceedings*.

**Nationalisation.** The estab. of the Post Office Savings Bank by Gladstone in 1861 is generally hailed as the first N. measure in Great Britain. The N. technique is essential to the institution of State ownership and to public control of the means of production, distribution, and exchange. At its Southport conference in 1934 the Labour party declared for 'public ownership and control of the primary industries and services,' and listed for subsequent N. banking and credit, transport, water, coal, electricity, gas, agriculture, iron and steel, shipping, shipbuilding, engineering, textiles, chemicals, and insurance. Herbert Morrison urged persistence with such a programme 'until within a reasonable time we are substantially masters of the economic fabric of the community and the means of production and distribution.' Official Labour party policy had resisted, hitherto, the confiscation of private property.

The salient provisions of some representative post-war N. measures were:

**Bank of England Act.** (1) The whole stock of the Bank of England, hitherto owned by 17,000 private stockholders (of whom 10,000 owned less than £500 each), was taken over by the Treasury, with powers, in consultation with the governor, to give directions to the bank. (2) The court of governors was reduced from a deputy-governor and 24 directors to a deputy-governor and 16 directors, all appointed by the Crown. 'The Bank of England is already very largely a department of the Treasury,' commented Lord Pethick-Lawrence, 'and its nationalisation will not make a pennyworth of difference to the bulk of the people. . . .'

**Civil Aviation Act.** This was based on the Labour Gov.'s White Paper of 1945 (Cmd. 6712) and the war-time Conservative-dominated Coalition Gov.'s White Paper of 1944 (Cmd. 6605). It brought all regular air transport services under national ownership and control, ended nearly all competition, furnished state finance for the 3 corporations, and authorised the minister to tell them what aircraft to employ, and where. A consolidating measure followed in 1949.

**Coal Nationalisation Act.** This made 8 divs. of the country's 8 coal-producing regions, each with a divisional board appointed by the National Coal Board, with each div. broken into 49 areas, each with an average of 20 collieries. National Coal Board members comprised specialists in production, labour relations, finance, marketing, etc. This project reinforced the war-time coal control of the Ministry of Fuel and Power with its 12-section regional structure. Two



industries—road transport and iron and steel—have been nationalised and then denationalised.

Earlier transport legislation comprised: (1) the Railways Act, 1921, the first U.K. experiment in 'rationalisation'; (2) the Road Transport Act, 1930, which forbade the provision of passenger road transport except by road service licence-holders (Labour); (3) the London Passenger Transport Act, initiated by the Labour Gov. in 1931, which became law under the National Gov. in 1933 and gave legislative sanction to 100 per cent monopoly; (4) the Road and Rail Traffic Act, 1933, which extended licensed semi-monopoly from road passenger traffic to road haulage. The Transport Act, 1947, created the Brit. Transport Commission, with chairman and 4 to 8 members to be appointed by the minister, estab. 5 public authorities (executives), railway, docks and inland waterways, road transport, London transport, and hotels, and interpreted the railway executive as a 3-tiered structure, with regions akin to the former railway companies. The Transport Act of May 1953, the denationalisation measure, restored the principle that alternative forms of transport should be 'co-ordinated' by consumers' choice, and arranged for the sale to private enterprise of the road haulage undertaking of the Brit. Transport Commission.

The movement for iron and steel N. dates from 'rationalisation' measures in 1932 and 1934, the Import Duties Act, the 33½ per cent duties on iron and steel imports (contingent upon 'reorganisation'), and the relationship between the Import Duties Advisory Committee and the Brit. Iron and Steel Federation (which fixed prices and controlled competition). The terms of the Iron and Steel Nationalisation Act, 1949, were that the securities of the firms either working 50,000 tons or more of iron ore or producing 20,000 tons or more of pig-iron or 20,000 tons or more of ingot steel or hot-rolled steel each year should be transferred (with subsidiaries) to a new corporation with the powers of a holding company over its nationalised subsidiaries. The Conservative Gov. unscrambled the 1949 Act with its own denationalisation measure, the Iron and Steel Act, 1953, but retained a large proportion of the 1949 machinery in order to establish an independent Iron and Steel Board, entrusted with the duty of fixing maximum prices and of supervising the industry's supply of raw materials. Proposals have been advanced from time to time for the N. of the land. They have made little headway.

In the early 1950's the Labour party showed symptoms of disappointment or even disillusion with N., and by the late 1950's N. had almost disappeared from Labour policy statements. It was replaced by proposals for acquiring ownership of (part of) the controlling shares of large companies ('N. by the back door').

See J. Jewkes, *Ordeal by Planning*, 1948; E. Goodman, *Forms of Public Control and Ownership*, 1951; D. N.

Chester, *The Nationalised Industries* (revised), 1951; Ben W. Lewis, *British Planning and Nationalisation*, 1952; W. A. Robson (ed.), *Problems of Nationalised Industry*, 1952; H. A. Clegg and T. Chester, *The Future of Nationalisation*, 1953; Select Committee on Nationalised Industries, *Special Report*, 1955.

Nationalism, spirit of nationality, the predominant feature of the modern state system and, in the language of political thought to-day, the antithesis of internationalism. In an age when political ideas and doctrines have become the staple of current conversation, N. has occupied the forefront of discussions of foreign affairs as one of the idea-forces in the contemporary world. N. is not to be confused with racialism, for many races may be incorporated in one nation-state, though racialism was the strongest element in the particular type of N. preached by Hitler. N. was the inevitable sequel to the growth of the nation-state out of feudalism and the medieval conception of sovereignty as developed by Machiavelli, Hobbes, Locke, and Rousseau. N. is a commonplace to-day, because it is natural that a politically compact people, speaking the same language and sharing the same historical traditions and social customs or creed, should be united as a sovereign independent nation. It is only with the growth of the modern spirit of nationality that the complex problem of the national state arises. Neither religion, language, territory, tradition, nor economic interests can claim monopoly or even predominance in the growth of N. Unity of language is a strong factor but by no means decisive; Soviet Russia contains hundreds of different languages. Conversely a common language did not prevent the separation of the Amer. colonies from England. Unity of religion may have formed the national character of the Spaniards or the Scots, but the great religious split between Protestants and Catholics has failed to prevent national unification in Germany. Unity of economic interest has more often than not been ignored in favour of more irrational considerations—the hist. of the peace treaties of 1919 shows an almost uninterrupted record of N. cutting across economic ties. Perhaps the most prevalent influence is community of hist., tradition, and culture, difficult to define in general terms, but altogether exercising an immensely powerful influence. Certainly patriotism may be the dominant note with individual political thinkers, as illustrated by Mazzini's stirring address to his fellow countrymen (1859) to take up arms against their foreign masters. In the early 19th cent. N. was a revolutionary force, deriving its impetus from a sense of tyranny among many peoples who were far from enjoying political freedom. This revolutionary force was most strikingly exemplified in France, under the inspiration of the teaching of Rousseau. This teaching spread to other nations of Europe, and within a cent. the spirit of nationality produced an independent Greece, Belgium,

Serbia, Norway, Italy, and Germany. N. has become an articulate force throughout the world; thus the consciousness of nationality was only awakened among the Chinese by the labours of Sun Yat-sen, though in his *Three Principles of the People*, 1924, he speaks of his country's 'lost nationalism, the revival of which is the divine mission of its four hundred million people.' Under this revolutionary influence the peoples of the European countries became conscious of nationality for the first time in their hist., with all its implications, the chief of which was that patriotic men of the same nation should be brothers-in-arms ready to defend their liberties and traditions, their customs or way of life, against the tyrant, and their hearths and homes against the external aggressor. N. has yielded impressive results in political democracy, inspiring great deeds, stimulating art and literature, and promoting popular education. But it was employed too often to emphasise to citizens what was peculiar in tradition and achievements to their own nation, rather than what mankind shared by way of common heritage. It emphasised the exclusiveness of each state and it encouraged selfishness in a new and national form. It brought nations which had not yet achieved complete unity and independence, like the Poles, the Irish, and the Czechs, into conflict with more fortunate nations; while in the fortunate nations it induced a selfish intolerance which led to the oppression of dissident minorities and to the forcible imposition of their own civilisation arbitrarily upon those whom they regarded as 'inferior' races. Yet N. had an important mission in the world by marking the final conflict and end of 2 forces which are the worst enemies of civil freedom—the absolute monarchy and the revolution. Ideally N. should have led, not retrogressively to 18th-cent. indifferent cosmopolitanism, but towards 20th-cent. internationalism, to a federation of all the free nations of the world for mutual co-operation and support. It was the tragedy of N. that on the eve of the First World War it had not led to this goal; on the contrary, it was the major predisposing cause of that war. N. was no less a decisive factor in bringing about the Second World War. Ger. N. became so aggressive that it sought to interfere in the affairs of other states wherever there were minorities of Germans. Everywhere in the 20th cent. the spirit of nationality operated to reinforce the anarchy both of international politics and of international economics. Conversely N. in the U.S.A., whose public opinion has a profound effect on policy the world over, was so narrowly involved in what may be called the Amer. way of life as to stress isolationism and to turn away from internationalism even at the cost of security. A most important development of N. in Germany, Japan, and the other newer states was the economic activity of the state, in which theories of a planned economy acquired force from protective tariffs as an integral factor of political strategy. In modern

Germany this has been especially exemplified by the malign activities of the I. G. Farben Trust in exploiting, or in aiming at the exploitation of, the whole continent of Europe; but a development so directly in conflict with the individualism of liberal political theory, far from being a highly modern one, has its inspiration in the economic doctrines of Johann Gottlieb Fichte, Adam Müller, and Friedrich List. The emergence of Japan as a national state affords striking parallels to that of Germany in spite of the very different racial, historical, and social background, the nobility, feudal leaders, and merchants creating a modern state which rested on very similar foundations to those of the Germany of Hitler. If in the older national states (Britain, U.S.A.) political authority and economic interests did not co-operate in a common plan, the exigencies of war have resulted in assimilating their relative position closely to that of the totalitarian states. In modern conditions, when improving communications have made the world one economic system, N. has outlived its day. It has a place only as a means of emphasising the need for freedom for national cultures. Beyond that it has no place in an age when the need is for the nations to co-operate in economic organisation and exchange, scientific research, and in combating disease. See B. Russell, *Freedom and Organisation, 1814–1914*, 1934; J. Huxley and A. Haddon, *We Europeans*, 1935; H. Lasak, *The State in Theory and Practice*, 1935; L. C. Robbins, *Economic Planning and International Order*, 1937; *Nationalism*, by study group of Royal Institute of International Affairs, 1939; A. Zimmern (ed.), *Modern Political Doctrines*, 1939; E. H. Carr, *The Future of Nations and The Twenty Years' Crisis*, 1939; W. Röpke, *International Economic Disintegration*, 1942; W. Friedmann, *The Crisis of the National State*, 1943; H. M. Chadwick, *The Nationalities of Europe and the Growth of National Ideologies*, 1945; B. C. Shafer, *Nationalism: Myth and Reality*, 1955.

**Nationalist Party (Irish)**, Irish political movement for Home Rule (q.v.) which became an important force in the Brit. House of Commons in the late seventies of last cent. under Parnell (q.v.). When the Liberals and Conservatives were of almost equal strength the Nationalist vote was of vital importance. John Redmond (q.v.) succeeded Parnell as the party's leader in 1890. It became defunct in 1918 on the rise of Sinn Féin (q.v.).

**Nationality Act, British (1948)**. This Act, which was enacted on 30 July 1948, replaces the British Nationality and Status of Aliens Act of 1914 as the basis of the law of Brit. citizenship. Every person who, under this Act, is a citizen of the U.K. and colonies, or who is or becomes a citizen of Canada, Australia, New Zealand, the Union of S. Africa, India, Pakistan, S. Rhodesia, and Ceylon, shall by virtue of that citizenship have the status of a Brit. subject. Every such person having such status has the choice of being known as a Brit. subject or as

a common citizen of the commonwealth, both expressions having the same meaning (this proviso was made because some might not wish to be called Brit. subjects, e.g. Fr. Canadians or Indians or Sinhalese). The Act provides a new method of giving effect to the principle that the people of each self-governing country within the Brit. Commonwealth have both a particular status as citizens of their own country and a common status as members of the commonwealth. Under a common clause accepted by all the commonwealth countries (except the Rep. of Ireland, q.v.) all persons recognised as Brit. subjects in any part of the commonwealth are recognised as such throughout the whole of it. To preserve the principle of complete unity of status, there is a single citizenship, governed by identical conditions and applicable without distinction to the peoples of the U.K. and Brit. colonies. The permanent provisions governing the acquisition of citizenship of the U.K. and colonies are based on the principles previously governing the acquisition of Brit. nationality under the Act of 1914. The first generation *b.* in another commonwealth country of a father *b.* in the U.K. or colonies is a citizen of the U.K. and colonies, but not the second generation. Citizens of the U.K. and colonies who acquire citizenship of other commonwealth countries (i.e. possessing 'dual citizenship') may, if they wish, denounce their citizenship of the U.K. and colonies. Citizens of the Rep. of Ireland cease to be Brit. subjects, though Rep. of Ireland citizens in the U.K. at the time the Act was passed continue to have all the rights and obligations of Brit. subjects, and all Rep. of Ireland citizens are treated under Brit. law in the same way as Brit. subjects and not as aliens. The Act removes women's disabilities as regards nationality, and for nationality purposes married women are placed in the position of single women. From the date when the Act became law, women citizens of the U.K. and colonies do not, as theretofore, lose their citizenship on marriage to aliens, and may only divest themselves of it by a formal act of renunciation. Women married to aliens when the Act was passed had their nationality restored, becoming citizens of the U.K. and colonies or of some other commonwealth country. Alien women marrying citizens of the U.K. and colonies no longer automatically acquire citizenship on marriage, but if they desire may apply for registration, to be granted in the home secretary's discretion. Women citizens of other commonwealth countries on becoming citizens of the U.K. and colonies do not automatically acquire their husband's citizenship, but may claim it as of right, whether or not they are resident in the U.K. or colonies.

In April 1949 Eire (S. Ireland) became, by her own action, a rep. and left the commonwealth. But, in fulfilment of the Brit. Prime Minister's promise that S. Irishmen would not be treated as foreigners in the U.K., in spite of their country's unilateral action in declaring

her independence of Crown and commonwealth, the U.K. Parliament in May introduced the Ireland Bill, one purpose of which was to confirm citizens of the new rep. in all the rights which they held in the U.K. while the Rep. of Ireland was still a member of the commonwealth. The effect of the Bill is that inhab. of the Rep. of Ireland can claim to remain Brit. subjects or, if they prefer, be citizens of the Rep. of Ireland and still reside in the U.K. on the same conditions as in the past. A new clause was inserted in the Bill as the result of an amendment by the Lords to which the gov. agreed. It made clear that, whatever might be the position under the Rep. of Ireland, a person *b.* in S. Ireland of a S. Irish father, who was domiciled in N. Ireland on 6 Dec. 1922, and who had not acquired the Rep. of Ireland citizenship by residing permanently in S. Ireland on or after 10 April 1935, or by registering as a Rep. of Ireland citizen, did not cease to be a Brit. subject on 1 Jan. 1949, and became on that date a U.K. citizen unless he was a citizen or potential citizen of some other commonwealth country. But the special status thus accorded to Irish citizens by this Bill involves questions in international law and international relationships which are not within the competence of the Brit. Parliament to settle, and indeed they remain to be answered.

**Nativity**, name for Christmas, celebrating the birth of Jesus Christ on 25 Dec. The N. of the Blessed Virgin Mary is celebrated on 8 Sept.; this festival was formally appointed to be observed by the Synod of Salzburg in AD 800, but had in reality been celebrated since about 690. The N. of St John the Baptist is celebrated on 24 June. For the various usages in connection with the N. of Christ, see CHRISTMAS. In astrology N. has the same meaning as horoscope.

**N.A.T.O.**, see under NORTH ATLANTIC TREATY.

**Natrolite**, zeolite, secondary product after minerals of the nepheline group, is found in the basalts of Ireland and Scotland, Auvergne, etc. It has the composition  $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 3\text{SiO}_2 \cdot 2\text{H}_2\text{O}$ , is white or yellowish-red in colour and usually transparent (sp. gr. 2.2, hardness 5.5). Fuses in the candle flame, and gelatinises with acids, silica being liberated.

**Natron**, naturally occurring sodium sesquicarbonate,  $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$ , formed by the gradual drying up of soda lakes. Deposits occur in many regions, notably near Lake Magadi in Kenya, in Mexico, Venezuela, Hungary, and the U.S.A. The **N. Lakes** are a group of lakes, some 8 in number, situated in the Wady Atrun or N. Valley, Libyan Desert, Egypt, 60 m. WNW. of Cairo. The locality is also noted for 4 monasteries, from whose libraries many valuable MSS. have been added to European collections.

**Natterjack**, or **Rush Toad** (*Bufo calamita*), found in N. and W. Europe, and Britain. It is smaller than the common toad, with shortened hind limbs and short, almost webless toes; it is yellowish-brown, with a yellow line down the back. It

moves by walking or by short runs instead of hopping. The male has a vocal throat sac which, when distended, is larger than the head. The eggs are laid in the water and the tadpoles are extremely small.

**Natural** (in music), term applied to any uninflected note (i.e. notes on the white keys of the piano). The normal key, which begins on C, is constructed on N.s. The sign ♯ is used to cancel a preceding sharp or flat.

**Natural Gas.** In some parts of the world gases of different composition are found associated with rocks of varying geological age. They are usually confined under pressure, and boring serves to free them from their site. The gases often consist of a mixture of hydrocarbons of the methane series in which the first member, methane, predominates. But there may be present ethane, propane, butanes, pentanes, hexanes, etc., as well as nitrogen, carbon dioxide, and sometimes helium and other rare gases. Occasionally hydrogen sulphide is present in fair amounts. These N. G.s are frequently associated with oils. About 95 per cent of the world production of N. G.s comes from the U.S.A., whilst Canada is responsible for the larger proportion of the remaining 5 per cent. The gases are commonly carried for hundreds of miles in pipes and are employed for heating purposes, domestic and industrial. The calorific value is high (unless a high percentage of nitrogen is present), being in the region of 1000 B.Th.U. per cub. ft. In addition to this, N. G. has been put to useful advantage in the making of many valuable organic products such as methyl chloride, alcohol, etc., in the driving of gas engines (q.v.). In Utah, Colorado, and at Medicine Hat in Alberta there occurs a N. G. which is comparatively rich in helium, and by a process of fractionation all the other gases present are liquefied, whilst the helium is pumped off and purified as far as possible. This is the source of the helium employed in science and industry. The origin of this gas is probably radioactive transformations which have taken place in the past.

To some extent N. G. is found in coal-mines, when it gives rise to the dreaded firedamp. The mixture of the gas with air is apt to be a very explosive one, and as it has neither any particular colour nor smell it can only be detected by special means (see DAVY LAMP). Again the N. G. sometimes takes the form of carbon dioxide mainly. This, in virtue of its high density compared with that of air, is inclined to collect in pockets.

**Natural History**, term which originally meant the systematic study of all natural objects, animal, vegetable, and mineral, and thus included all sciences, such as biology, geology, chem., etc. With increasing knowledge and the growth of specialisation, such a term by its very vagueness became unsuitable in many cases. Subsequently it became restricted to the biological sciences, and then to field studies of animals and plants, where it has recently been supplanted by ecology (q.v.). The name is now falling into

desuetude, but survives in such titles as the Museum of N. H., or, to give it its true title, the Brit. Museum (N. H.). See BIOLOGY, HISTORY.

**Natural History Museum**, see BRITISH MUSEUM.

**Natural Order of Plants**, system of classification of the members of the vegetable kingdom according to the natural affinities of their structural and essential characters. Individual plants, identical in their constant characters, belong to a *species*; related species to a *genus*; related genera to a *family* (formerly termed natural order); related families to an *order*; related orders to a *class*; and related classes to a *division*. Intermediate categories are denoted by the prefix *sub* (e.g. subgenus).

**Natural Philosophy**, term denoting science as a whole, or that branch of it usually called physics at the present day. The philosophy of the ancients included the study of natural phenomena and hypotheses regarding their relations. As knowledge progressed, there was a tendency to subdivide science into various spheres. In the course of differentiation, the term natural philosophy was retained for the science of the physical properties of bodies. See also HEAT; LIGHT; MAGNETISM; PHYSICS; SOUND. See Sir E. Whittaker, *From Euclid to Eddington*, 1940.

**Natural Theology** deals with such knowledge of God as may be attained by the human reason without the aid of divine revelation. The Eng. classical defence of N. T. is Wm Paley's *Evidences of Christianity*, 1794. The aim of N. T. is to prove that God exists and to evolve such a notion of God as is attainable by pure human reasoning. This it strives to do from 6 main arguments: (1) That of general consent. The universal belief of mankind has more than a subjective value; it bears witness to a law impressed in our nature. (2) The cosmological argument, which, taking the world as the effect, argues *a posteriori* to a first cause. (3) The teleological argument, or argument from design, stated by Paley in his first chapter, where he makes the well-known comparison of the world to a watch. (4) The ontological argument, which we owe to St Anselm, which bases belief on the statement that 'that must exist than which no greater can be conceived.' It is developed at length in his *Proslogion*. The argument of St Anselm is generally discarded. (5) The argument from man's moral sense; and (6) the argument from design in hist. Aquinas elaborated (2) and (3) into his 5 proofs of the existence of God, as the first mover, the first efficient cause, the necessary and independent being behind all contingent things, as the supreme good which is the source of every perfection, and as the ultimate designer of a designed universe. From each and all of these attributes he deduced the idea of God as simple, spiritual, autonomous Being, infinite and perfect, transcending the created universe. See F. C. Copleston, *Aquinas*, 1955.

**Naturalisation**, see **ALIEN**.

**Naturalism**, philosophical term which has borne different meanings according to its use. At present it generally denotes the antithesis of idealism (q.v.), and is akin to, though differing slightly from, materialism and pantheism. In theology it is the denial of the supernatural system of sanctifying grace.

**'Nature'**, weekly periodical, estab. in Nov. 1869. In leading articles and notes it directs attention to the impact of scientific advances on human affairs. It also includes articles on new scientific work, full accounts of new discoveries, reviews of notable books and papers, and accounts of noteworthy meetings.

**Nature Printing**, name of a process of obtaining plates or engravings by means of impressions taken from the actual objects, and by printing from these impressions. This process can only be used in connection with objects which have flat surfaces, such as lace, and dried plants. The result is obtained by placing the object between 2 plates, one of copper and another of lead, and by pressing the plates by means of a pair of rollers. The impression thus produced on the leaden plate may be used if only a few copies are needed, but if a large number are required a facsimile of it may be obtained on copper by the electrotype process. A more direct method, called *Hay Printing*, is to place a piece of wood just under type-high on a hand press. Ink a copper plate, lay the grass or leaf on the inked plate, and cover with a sheet of clean waste paper. Place a sheet of rubber over all and close the press. Give a hard squeeze with plenty of dwell. Lift the inked copper plate off the wooden block, substituting a clean sheet of copper on which place the paper to be printed. Lift off the rubber sheet from the inked pad, peel off the waste sheet, and with tweezers lift the object from the inked plate and lay it inked side down on the printing paper. Add a sheet of waste, then the rubber pad and print. Remove the rubber and waste sheets by lifting the object from the paper.

**Nature Study**, frequently a subject in the curriculum of a school, especially primary schools. The study of nature rather than of books has, however, long been argued by educational reformers. Claims for N. S. have been based on philosophical and pedagogical grounds. The first reflect the 17th-cent. interest in science and methods of acquiring knowledge. Pedagogically, N. S. emphasises the importance of things rather than words, observations rather than rote learning, and is held to provide opportunities for children to learn through having their interest aroused in their natural environment. In practice, N. S. has been identified with the study of plants and the habits of animals. Many primary schools have nature tables where collections from nature are exhibited. The vocational interest of N. S. has been developed in some schools through gardening, and by the keeping of small livestock, like poultry and bees. The theory which lies behind the practice of N. S. is

still widely held in educational circles throughout the world.

**Nature Worship** assumes various forms. Usually the powers of nature are personified and made the object of adoration (see **ANIMISM**; **FETTERISM**; **MYTHOLOGY**; **TOTEMISM**). Fertility cults are often important (see **PHALLUS**). The sun and moon and stars have been worshipped (see **ASTROLOGY**), and still are among some peoples. So too with rivers, water, and mts; sometimes the thing itself is adored, sometimes a spirit embodied in it. See also **MOON**; **PAGANISM**; **PANTHEISM**; **SUN WORSHIP**. See Sir J. G. Frazer, *The Golden Bough* (3rd ed.), 1907-15, and *The Worship of Nature*, vol. 1, 1926, and W. Schmidt, *Origin and Growth of Religion*, 1931.

**Nauvrat**, Gk trading settlement in Egypt, near modern Nebireh, and approached anciently by the Canopic mouth of the Nile. It was discovered in 1884 by Petrie, and identified by inscriptions and much early Gk pottery. Traces of the sev. temples mentioned by Herodotus were found. N. was probably originally a Milesian colony founded in the 7th cent. bc. Its zenith was in the 6th cent., and it was still important in Ptolemaic times.

**Naudé, Gabriel** (1600-53), Fr. scholar and librarian, b. Paris. He studied medicine at Paris and Padua, and was physician to Louis XIII. In 1628 he took charge of Cardinal Bagnio's library, and in 1641 was librarian to Cardinal Barberini and later to Queen Christina of Sweden. His book *Advis pour dresser une bibliothèque* (2nd ed., 1644), was the first to consider the methodical arrangement of a library. In 1653 he was requested by Mazarin to come and help him to re-form his library, which N. had helped to collect, and was on his way when he d. at Abbeville.

**Nauen**, Ger. tn in the dist. of Potsdam, 15 m. NW. of Potsdam (q.v.). It has engineering and food-stuff industries, and formerly had a radio station. Pop. 13,000.

**Naugatuck**, tn coextensive with Naugatuck bor. in New Haven co., Connecticut, U.S.A., situated below Waterbury. It is a rubber centre; it manufs. chemicals, glass, plastics, wire goods, jute and cotton fibre products, machinery, and tools. Charles Goodyear estab. a rubber factory here in 1843. Pop. 15,300.

**Nauheim**, Bad, Ger. spa in the *Land of Hessen* (q.v.), at the E. end of the Taunus Mts (q.v.), 28 m. NE. of Wiesbaden. It has thermal saline springs, and there are medical research institutes. Pop. 14,000.

**Naumachia** (Gk *naumachia*, from *naus* - ship; *machē*, a battle), the name which the Romans gave to the mimic sea-fights which were waged as a spectacle, and also to the scene of the combats. The latter took place sometimes in the Circus Maximus, water being introduced sufficient to float ships. The first N. on record represented an engagement between the Tyrian and Egyptian fleets, and was given by Julius Caesar in 46 bc in the Campus Martius. The custom of

exhibiting naumachiae was not confined to Rome, as we find arrangements for flooding the amphitheatre at Capua and Nîmes. The combatants fought as in the gladiatorial games, no quarter being given; gladiators or condemned criminals were employed.

**Naumburg**, Ger. tn in the dist. of Halle, on the Saxonian Saale (q.v.), 25 m. S.W. of Halle (q.v.). It once belonged to the Hansatic League (q.v.) and has a fine 13th-14th-cent. cathedral. It has a wine trade and engineering industries. Pop. 40,000.

**Naunton, Sir Robert** (1563-1635), statesman and author, b. Alderton, Suffolk. Educ. at Trinity College, Cambridge, he became public orator to the univ. He was made master of requests by James VI and I in 1603, and after holding other political offices was appointed secretary of state in 1618. He wrote *Fragments Regalia*, or *Observations on the Late Q. Elizabeth*, her *Times and Favorites*, 1641. See ed. by J. Caulfield, 1814, with N.'s memoirs.

**Nauplion**, or **Anapli**, tn and seaport, cap. of dept of Argolis and Corinth, Greece, at the N. extremity of the Gulf of Argos or Nauplion, and 7 m. S.E. of the tn of Argos. In the 13th cent. it was occupied by the Venetians, and was taken by the Turks in 1540. From 1824 to 1834 it was the cap. of Greece. The roadstead is one of the best in Greece, having deep water and good shelter. Pop. 8500.

**Nauplius**, King of Euboea and father of Palamedes. To avenge the death of his son, whom the Greeks had killed during the siege of Troy, he watched for their return, and as they approached the coast of Euboea wrecked them by lighting torches on the dangerous promontory of Caphareus.

**Nauplius**, unsegmented larvae of the lower crustacea with a single frontal eye. See CRUSTACEA.

**Nauru Island**, is. in the Pacific Ocean, situated in 166° E. long. and 26° S. lat., administered under mandate by Great Britain, Australia, and New Zealand. In Nov. 1947 the U.N. general assembly brought N. I. within the U.N.'s trusteeship system, with the govs. of Australia, New Zealand, and the U.K. as joint administering authority. Valuable phosphate deposits were discovered in 1900 and developed by the Pacific Phosphate Co. In 1919 these interests were bought up by the mandatory govs. The revenue in 1938 was £30,000. The is. was bombed by Jap. planes on 10 and 12 Dec. 1941, and occupied in Aug. 1942, until the Jap. surrendered in Sept. 1945. Area 8 sq. m.; pop. 2700, of whom 200 are Europeans.

**Nausea**, sense of sickness at the stomach, a desire to vomit. The word is derived from the Gk *naus*, a ship, and is therefore especially associated with sea-sickness. The condition is, however, brought about by many varied affections of the nerves and digestive organs, and is a symptom of many diseases.

**Nausicaa**, beautiful daughter of Alcinous, King of the Phaeacians, and his

queen Arete, noted for her simplicity, modesty, and gentleness. One day while she played ball on the shore with her maidens, the shipwrecked Ulysses suddenly appeared, striking terror into all but N., who took him to her father. See *Odyssey*, vi.

**Nautch Girl** (Hindu *nach*, dance), Indian professional dancing girl. Many are attached to temples where they perform sacred dances in bejewelled dresses; others are hired to entertain guests at private secular dances, i.e. nautches in the strict sense. The dance consists of posturing and slow steps, each part of the body being used to express emotion.

'**Nautical Almanac**' gives the spherical co-ordinates of the moon for every hour, and of the sun, planets, chief stars, and also the rectangular co-ordinates of the sun, for every day of the year (those of the stars change so little that 10-day intervals suffice), time of occultations, of sunrise and sunset, moonrise and moonset, of eclipses, and scores of other matters essential to the astronomer. It is pub. annually at least a year in advance and collaboration between the N. A. office and other similar institutions in different countries is essential, owing to the magnitude of the work involved in making the necessary calculations. It was first produced in 1766 for 1767, and was the responsibility of the Astronomer Royal until 1832 when it was pub. by order of the Board of Admiralty.

**Nautical Surveying**, see HYDROGRAPHIC SURVEYING.

**Nautiloids**, fossil cephalopod molluscs with straight or coiled chambered shells, and gently curved transverse septa. They range from Upper Cambrian to Recent times. *Nautilus*, which is tetrabranchiate, is the only living representative.



NAUTILUS POMPILIUS

A, swimming; B, shell in section; C, crawling.

**Nautilus**, name given to 2 distinct Cephalopods, but the pearly N. is generally indicated, the paper N. being referred to the quite distinct genus *Argonauta*. The genus N. inhabits the Indo-Pacific Ocean

and differs from all other living Cephalopods in having 4 gills instead of 2, whence it is placed in a separate order (Tetrabranchia) of its class. Of over 30 genera of that order it is the only surviving genus. It differs, too, in having a number of small retractile feelers instead of arms with suckers and hooks, and in having an external chambered shell. The shell is pearly within, and has a regularly convoluted form, the last whorl being equal to all the others. The chambers or cells are perforated towards the centre by a slender tube or syphon. The number of partitions in the cell indicates the periods of growth, a new outer chamber being added as the capacity of the previous one is outgrown. The total number of compartments is often about 30. Externally the shell is covered with a calcareous layer and is brown in colour and marked by dark bands 'like a tortoise-shell cut.' The shell yields a fine mother-of-pearl, which is used for inlaying. The N. frequents the sea bottoms, where, with its foot, it can make fairly rapid progress. It lives chiefly on molluscs and small crustaceans, and is sometimes taken in lobster pots and hoop nets. Like other members of its class, it occasionally swims backwards on the surface by propelling spouts from the syphon, the head and tentacles being projected out of the shell; but the rise is probably involuntary and caused by storms. The animal appears to be much exposed to the attacks of various enemies, having no operculum, and being but feebly attached to the shell, and it is a Cephalopod which lacks the power of discharging an ink-like fluid to darken the water to escape from its enemies. On the Nicobar coast of India its flesh is salted and dried.

**Navaho**, most important tribe of the S. div. of the Athabaskan stock of the N. Amer. Indians. They acquired sheep from the Spaniards, and after wars with the U.S.A., in 1863 Col. 'Kit' Carson killed their sheep and took most of the tribe prisoners; later they settled to a sheep-rearing life in New Mexico and Arizona; their blankets are famous. They number about 45,000. See C. Kluckhohn and D. Leighton, *The Navaho*, 1947.

**Naval Air Arm**, title given in 1946 to the air component of the R.N., previously known as the Fleet Air Arm (q.v.). The N. A. A., or naval aviation, comprises from one-quarter to one-third of the total strength of the R.N.

**Naval and Military Research Societies**. Probably the best known of these is the Royal United Service Institution, with its imposing home in Whitehall. There are among others the Institute of Royal Engineers at Chatham; the Royal Artillery Institution at Woolwich, and the Institution of Naval Architects; the Society for Army Historical Research; the Society of Nautical Research; and the Navy Records Society. Most of these bodies issue quarterly magazines: *The Journal of the Royal United Service Institution*, *The Royal Engineers' Journal*, *The Journal of the Royal Artillery*, *The Mariner's Mirror*, *The Journal of the*

*Society of Nautical Research*, and *The Journal of the Society for Historical Research* (estab. soon after the First World War) are all well-known productions which deal with naval and military subjects of current or historical interest. The Navy Records Society has no periodical, but issues rare and hitherto unpub. records of the navy in vol. form, dealing with special events or important persons.

**Naval Cadet**, see NAVAL EDUCATION.

**Naval Colleges, Royal**, see NAVAL EDUCATION.

**Naval Discipline Acts** define the offences and procedure of naval law. The first comprehensive code was drawn up by command of Richard Cœur de Lion in 1194 after his return from the third crusade. This code was known as the Naval Laws of Oléron from the is. in which the code was drawn up and sealed. It became the virtual basis of the sea laws of 1530 drawn up by order of King Henry VIII, of which naval discipline forms a large part. The Act which is now in force is the Act of 1884, which amended the Act of 1866. This Act defines the constitution of the court-martial which tries naval offences, and regulates its personnel according to the rank of the person charged. The Act also defines the limit of locality for naval law. It was revised in 1957. See COURTS-MARTIAL.

**Naval Education**, for officers, is given at: (1) The Royal Naval College, Dartmouth, through which officers are normally admitted to the R.N. Under the new scheme, estab. in 1956, competitive examinations, held near the candidate's own school, make an initial selection, and admissions are finally decided by a full day's test of character, aptitude, and intelligence. There is free board and lodging, parents paying for uniform and personal expenses according to their means. (2) The Royal Naval Engineering College, Keyham, for officers specialising in engineering. A course lasts 4 years and midshipmen join the college on completion of their cadet training. New classes join in Jan. and Sept. each year and training qualifies officers for service afloat in the engineering branch. (3) At sea by instructor and technical officers. (4) The Technical Schools of Gunner, Torpedo, Navigation, etc., at Portsmouth, and, to a smaller extent, at other dockyard ports, where all executive sub-lieutenants must qualify for lieutenant. Technical schools also provide courses for specialists and other officers. (5) The Royal Naval College, Greenwich, estab. in 1873 for the education of naval officers. Also includes the Naval Staff College, the Naval War Courses, the School of Naval Architects, and Women's Royal Naval Service Officers' Training Course. Instruction is given to naval and marine officers in all branches at all stages of their career in theoretical and scientific study bearing on their profession. The Royal Naval College is commanded by an admiral or vice-admiral (president) assisted by an administrative and professorial staff. The president also has direct control of the Naval War Courses, where

both senior and junior officers study the higher strategy of war. The Naval Staff College is commanded by a captain R.N. (director). Officers from the army and R.A.F. also attend the Naval Staff and War Colleges. (6) Other estabs. such as the Tactical Joint Anti-Submarine, Signal Schools, Royal Naval Air Stations, etc. All R.N. educational estabs. are open to officers of the dominion navies and those of India and Pakistan. Officers of foreign navies may also attend for special courses. *For men and boys—at boys' training*



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THE ROYAL NAVAL COLLEGE, DARTMOUTH  
Royal Naval Official Photograph.

estabs. such as H.M.S. *Ganges* (Shotley), H.M.S. *St Vincent* (Gosport), at R.N. barracks, in the training squadron, and at technical schools. At sea general education is carried out by instructor officers and schoolmasters. R.N. vocational training to give men an opportunity to improve their prospects of employment on return to civil life is carried out mainly by lectures at the naval depôts and at municipal training colleges, etc.

**Naval Expenditure.** The real beginning of the expenditure of a fair proportion of the public funds on the upkeep of the navy dates back to the time of Cromwell. Previously the navy, such as it was, had been supported chiefly by special grants and by ship money, a tax which is supposed to date back to the time of Alfred the Great. By the end of the Napoleonic

war (1815) the expenditure had reached the then colossal figure of £23,500,000. During the peace years which followed it remained evenly at about £7,500,000; this naturally increased during the Crimean War, when the figure again crept up to about £20 million. In the financial year ending Mar. 1914 the total amount voted for the navy was £45,075,000. Between the end of the First World War and 1935 various naval treaties kept N. E. within reasonable limits, and it did not much exceed £50 million. In 1935-6 expenditure was £60,050,000, a low figure in view of the fact that Germany was now free to build up to a higher ratio to Brit. construction and that scientific development in armaments involved ever-increasing expense. The chief factor in enhancing Brit. N. E. was the refusal of Japan and Germany to remain bound by any treaty limitations whatever. In 1938-9 the total was £113,810,000 and, in view of the menacing international situation, Great Britain contemplated adopting the 'escalator' clause (allowing building over the 35,000-ton limit) of the London Treaty, owing particularly to Jap. construction. In the year 1939-40 the figure rose to £149,399,000, 50 ships being added in the previous year and 60 more in the year 1939, all this construction being directed against Germany. In 1940-1 the total amount of N. E. rose sharply to £384,162,000, construction being limited only by the building capacity of the shipbuilding yards. This figure continued to rise and in 1943-1944 reached £690,563,761. On conclusion of the Second World War it naturally fell, and in 1948-9 dropped to £153 million. In the following year, however, it began to rise again to £189,250,000, owing mainly to improvements in naval and civilian emoluments, exhaustion of war stocks, and higher prices. With prices still rising, with the necessity to replace obsolescent equipment and to meet the advance of science by supplying the fleet with the latest devices (all more complicated and expensive), it is inevitable that N. E. remains high; but it is being reduced in accordance with the new defence plan for Britain announced in the White Paper pub. on 4 April 1957. The net total of the navy estimates, 1957-8, was £236 million, nearly £33 million less than the previous year. Under the new defence plan the strength of just over 120,000 in April 1957 will be reduced by the end of 1962 to below 100,000.

**Naval Gunnery.** The gun was the main weapon of the navies of the world from the time of its invention up to the Second World War, when aircraft were first used extensively in naval warfare. A basic problem of N. G. has always been that the ship provides a platform which is moving and unstable owing to the motion of the sea, and much technical skill and ingenuity have been directed to the solution of that problem. The naval gun of to-day, which is controlled by equipment that allows for the speed and course both of the firing ship and its target, and which is directed



by radar and fired automatically, is a most accurate weapon. Although aircraft were widely used by navies in the Second World War to attack ships and shore targets, and for defence against aerial attack, N. G. played an equal if not predominant role in all the aspects of the war at sea. All ships had to be ready to defend themselves by gun-fire from aerial attack. Ships destroyed by navalgun-fire included the *Hood*, *Bismarck*, and *Scharnhorst*, while allied battleships and smaller ships provided valuable gun-fire support to allied invading armies in Europe, N. Africa, and the Far E., by sustained and accurate bombardment of enemy shore targets. The roles of the gun and of aircraft in naval warfare are essentially complementary, but both weapons are certain to be replaced, to a degree as yet unknown, by the guided missile.

**Naval Manœuvres.** see NAVY AND NAVIES and STRATEGY AND TACTICS.

**Naval Operations in Second World War.** *Blockade of Germany.* The naval side of the war was opened by the Germans sinking by torpedo the 13,000-ton Atlantic liner, *Athenia*, on 4 Sept. 1939. This was the first Ger. submarine attack on the high seas and the ship, which was carrying 1400 passengers, was sunk without warning about 250 m. W. of Donegal; 128 persons lost their lives. As soon as war broke out the Brit. Gov. indefinitely suspended all their obligations under the London Naval Treaty, 1936, and the agreements of 1937 with the U.S.S.R., thereby giving Britain a free hand in building ships of any tonnage and armament whatsoever. The blockade of Germany was begun at once, though the war was quite well advanced before some of the more glaring loopholes in the blockade were plugged. While Italy remained neutral great quantities of oil and other essential commodities found their way through that country into Germany while, again, until Ger. exports were stopped, as a reprisal for the laying of magnetic mines, the blockade was defective in that it allowed Germany to exploit the various terrified 'neutrals.' Ger. merchant ships were soon being steadily driven from the seas in spite of the use of every artifice and every expedient of concealment to avoid capture. At the outbreak the total tonnage of Ger. ships at sea or in neutral or allied ports (excepting the Baltic) was about 1,105,000 tons. Practically all that shipping had been cleared off the seas by the second week of the war. Some was captured, some scuttled, and much of it interned. It was at once evident that Germany was prosecuting an unrestricted submarine campaign as violent as that on which her navy embarked in 1917, and that her submarine commanders had been given orders to sink all ships at sight and without warning. As time went on it became obvious that Germany's only hope of counteracting Britain's command of the seas was to sink, by fair means or foul, as great a total tonnage as possible. Early in the war only a certain measure of

success attended the R.N.'s operations against enemy submarines and it was fortunate that the menace did not at first approach the magnitude it assumed in the First World War. In Nov. 1939, after much mysterious talk about using 'a terrible secret weapon,' Germany tried the device of sowing the seas with magnetic mines dropped from aeroplanes or laid by submarine. But very soon one of these mines fell on swampy land on the E. coast so that its secrets were disclosed, with the result that ships were fitted with a defensive device called the 'degaussing' girdle (the gauss is a unit of magnetic flux) which had the effect of demagnetising or depolarising the ship. No less than 120,000 tons of Brit. merchant shipping were lost in the first fortnight of the war, while only 30,000 were lost in the second fortnight. In the ensuing period the total varied considerably, rising perhaps to as much as 70,000 tons Brit. and neutral. It was impossible, very early in the war, to apply the convoy system while so many of the ships were afloat on the high seas, but when it was applied its results were no less decisive than in the First World War. But however well devised and applied, these and other counteractive measures could hardly prevent occasional very serious losses at the hands of a powerful, determined, and resourceful foe.

*Loss of 'Courageous' and 'Royal Oak.'* On 17 Sept. 1939 the aircraft carrier *Courageous* (22,500 tons) was torpedoed and sunk, and of the total complement of 1202 officers and men, 515 lives were lost, including the commander. Grand-Adm. Raeder at about this time stated that if Brit. merchantmen were armed this would provoke counter-measures; but Churchill, then First Lord of the Admiralty, retorted that very soon the whole mercantile marine of the empire would be armed and, as time was to prove, their crews repeatedly defended themselves with success, often bringing down attacking seaplanes or bombers. Despite the menace from the air, vastly more developed than in the previous war, the navy's command of the seas enabled some 158,000 Brit. soldiers to be transported to France within 5 weeks from the outbreak of war—as compared with 148,000 men in 6 weeks in the First World War. More devious routes were taken than in 1914 and the ships had to carry a much greater load of guns, tanks, and mechanised material. Early in Oct. there was considerable intensification of the U-boat campaign against Scandinavian shipping and it was evident that the Ger. Gov. was not to be deterred by any considerations of neutrality where it was to their advantage to ignore them; and, at this time, the Ger. Gov. also announced that as Ger. submarines had been attacked by Brit. merchant ships every vessel of the Brit. mercantile navy would be regarded as a warship. This was a change of policy and was soon followed by the sinking of freighters off the coast of Brazil by an armed raider—probably the *Graf Spee* whose operations off the S. Amer. coast had been reported by the naval authorities at Durban. The

most serious loss sustained by the navy in the early days of the war was that of the *Royal Oak* on 14 Oct. in Scapa Flow, a few hours after 2 U-boats had been destroyed by depth charges S. of Ireland. The *Royal Oak*, a battleship of the *Royal Sovereign* class (29,150 tons), laid down in 1914, had recently undergone extensive repairs and had only been recommissioned in June 1939. After it had been revealed that the anchorage was not proof against the attack of a U-boat on the surface or half submerged at high water, steps were at once taken to obviate a recurrence.

*German war on neutrals.* The list of sunken cargo vessels was always a long one and the circumstances in which ships were torpedoed were frequently the theme of bitter comment by neutral ministers, who still seemed to labour under the impression that the Ger. Gov. would observe the accepted code of international usage. Thus there was an outcry in the U.S.A. on the Ger. seizure, on 15 Oct. 1939, of the Amer. *City of Flint* (5000 tons), carrying conditional contraband, in the Atlantic by the pocket battleship *Deutschland*, whose captain put a prize crew on board which took her to Murnansk. Later the vessel was released by the Soviet Gov. flying the swastika and was sighted by Brit. naval forces in Norwegian territorial waters. Fearful of Brit. action the Norwegians then interned the Ger. crew and restored the ship to her own crew. As regards the Brit. mercantile losses through the U-boat campaign, while no more than 1½ per cent of Brit. tonnage which was afloat at the beginning of the war had been lost at the end of a couple of months, the corresponding figure for the Ger. submarine service was 30 per cent. Moreover, by rebuilding, the net gain to the Brit. tonnage was considerable. Furthermore over 10 million tons of cargo were brought into Britain in the first 8 weeks of war and less than 250,000 lost; but over 40,000 tons consigned to Germany had been captured. Another severe Brit. loss occurred on 23 Nov. 1939, when the armed merchant cruiser *Rawalpindi* (16,687 tons) was sunk off Iceland. She was part of the N. patrol by which the contraband control of Ger. trade was enforced. In the face of overwhelming odds she engaged the Ger. battleship *Deutschland*, which was accompanied by another warship, maintaining the fight with her 6-in. guns until the whole ship was ablaze and sank with her flag flying, 39 officers and 226 men being lost. At this time 2 Ger. pocket battleships and probably one other cruiser were at large in the N. and S. Atlantic or near Madagascar. But already the Brit. Gov. had nearly 1 million tons of warships of all classes under construction and the number of hunting craft in home waters was trebled between 31 Aug. and 30 Nov. and was still being augmented.

*Battle of the River Plate—'Altmark' affair.* The most dramatic event at sea was now in process of enactment, when the Ger. pocket battleship *Admiral Graf Spee*, which had been operating in the Atlantic Ocean as a commerce raider since

the outbreak, was intercepted and attacked on 13 Dec. by the Brit. cruisers *Exeter* (8300 tons), *Achilles* (New Zealand ship, 7000 tons), and *Ajax* (7000 tons) off the coast of Uruguay, and, after a running fight lasting 14 hrs, was driven into the port of Montevideo, severely battered, with 36 of her crew dead and 60 wounded. The battleship, which was completed in 1936, was armed with six 11-in. guns and eight 5.9-in. guns, while her armament was superior to the combined power of all three Brit. cruisers, whose heaviest guns were only 8 in. The Brit. ships showed superior speed and manoeuvring and by using smoke screens boldly brought the enemy ship within range of their guns. The *Exeter* dropped out of the battle after suffering a number of hits, and proceeded to the Falklands for repair, while *Ajax* and *Achilles* kept up the pursuit. The *Graf Spee*, after endeavouring by one excuse or another to remain in Montevideo, was forced out of the harbour. Her captain, Langsdorff, was faced with the choice of submitting to internment or coming out to resume the fight with the Brit. cruisers which were watching outside the harbour for her. She came out, but not to fight, for she was scuttled in the fairway by her captain, who then took his own life. Yet all that awaited the battleship was *Ajax* and *Achilles* and the 8-in. cruiser *Cumberland*, which last-named had arrived to take the place of the damaged *Exeter*. The Ger. ship had on board 62 survivors of 9 Brit. merchant ships which had been previously sunk by her. These prisoners were released after the ship had put in to Montevideo, having been cooped up in the ship during the battle. The *Exeter*, which had led the attack, suffered a loss of 64 killed and 21 wounded and at the end only one 8-in. gun remained in action and that could only be fired by hand. The whole action was worthy to rank with the finest exploits of the R.N., and Henry Harwood, the commander of the squadron, was knighted and promoted to rear-admiral. The wreck of the *Graf Spee* was eventually sold to a Uruguayan dealer for £10,000. Over 300 other Brit. seamen, made prisoner from vessels sunk by the battleship before her destruction, were all this time aboard the Ger. vessel *Altmark*, which had been armed as an auxiliary ship. This ship had succeeded in escaping across the Atlantic and reaching the protection of Norwegian territorial waters which her captain proposed to use in order to convey the Brit. prisoners in triumph to Germany. But Brit. aircraft located the *Altmark* on 15 Feb. 1940, and she was intercepted by the Brit. destroyer *Intrepid* after having entered Josing Fjord in the hope of evading the Brit. warships. Orders were given by the Brit. Admiralty to enter neutral waters, search for the *Altmark*, and rescue any prisoners on board. Two Norwegian gunboats were at the mouth of the fjord. Captain Vian in command of H.M.S. *Cossack* offered to place a joint British-Norwegian guard on the *Altmark* and to escort her to Bergen for an investigation according to international law.

The offer was declined by the Norwegians, who declared that the *Altmark* was unarmed and that nothing was known of any prisoners on board. On these assurances the Brit. destroyers withdrew; but, after dark, on receipt of further Admiralty orders, the *Cossack* re-entered the fjord. The gunboats still refused to co-operate. The *Altmark* then tried to ram the *Cossack*, but ran aground and was boarded from the destroyer. After a short fight in which sev. Germans were killed or wounded, the *Altmark* was overpowered and the Brit. prisoners, numbering 299, discovered and released, part of the Ger. boat's crew surrendering while

civilian use and were all armed with 'Asdics' (anti-submarine device), the depth charge, and the gun. The Germans broke every rule accepted by the world for regulating mine warfare. Besides this they committed outrages upon fishing fleets, small unarmed merchant vessels, and upon lightships, and in order to counteract these methods thousands of guns were issued to the Brit. merchant and fishing fleets. Neutrals came to accept the Ger. illegalities and atrocities as part of the ordinary day-to-day conditions of war. Early in 1940 a number of Ger. merchant vessels tried to escape from neutral ports, but were either seized by



THE END OF THE 'ADMIRAL GRAF SPEE'

others fled across the ice to the shore. This must be one of the most dramatic rescues in the hist. of sea warfare. The unfortunate prisoners had been confined below and battened down ever since the battle of 13 Dec. and had been subjected to brutal treatment by the *Altmark*'s notorious captain.

**German illegalities.** By the end of 1939 the Germans had lost 9 out of the 57 U-boats with which they started the war, and probably less than 10 fresh submarines came into action in that period. Thus the enemy probably ended the year with about 58 U-boats, of which 20 were required for training, and the number operating at any one time possibly did not exceed 10. Allied losses were substantial, and great preparations were made to cope with the full scale of attack which was to come later. Britain began the war with a very modest number of destroyers, and by the middle of 1940 some 28 had been sunk, the number being balanced by the acquisition of new boats. The hundreds of other small craft, which supplemented the destroyers, were boats converted from

Brit. ships or followed the customary Ger. policy of scuttling themselves, relying on Brit. gallantry to save their crews.

**German losses in Norwegian waters.** In April 1940 the Germans sustained heavy losses during the invasion of Norway, whose territorial waters their warships and merchantment, or troopships disguised as merchantment, were using with impunity. Once the Brit. Gov. laid mines in these waters, but when the actual invasion of Norway followed, the Brit. fleet had already been decoyed northward to Narvik while the Ger. troopships and troop-carrying planes crossed the Skagerrak and landed the invading forces. Earlier in these operations off Norway the Brit. destroyer *Glow-worm* was lost in N. waters. Off Narvik (9 April) the *Renown* sighted, amid snowstorms, the *Scharnhorst* in the dim distance and opened fire. She hit the Ger. ship's forward structure at 18,000 yds range, but the *Hipper* threw a smoke screen across the tracks of the *Scharnhorst* and she escaped. Five Brit. destroyers under Capt. Warburton-Lee (awarded the V.C. posthumously) on the

same day gained a victory at Narvik over a number of Ger. destroyers, sinking 3. The Ger. Navy, as a result of the operations between 7 and 11 April, lost 4 cruisers or one-half of their pre-war strength in this class of ship, a number of destroyers, sev. U-boats, and numerous store-ships and transports. Again, at Narvik, 2 days after Warburton-Lee's action, the *Waspide*, accompanied by a strong force of destroyers, and led by Vice-Adm. Whitworth, advanced up Narvik fiord and sank 4 Ger. destroyers in Narvik Bay. Three others, which fled up a narrow inlet behind Narvik tn, were pursued and also destroyed. It was evident that in order to achieve the conquest of Norway the Germans were prepared to gamble with their navy. It is equally evident that had the Brit. Gov. realised that the invasion of Norway was intended, the R.N. might have sunk most of the rest of the Ger. Navy in the S. waters of Scandinavia. The Ger. invasion having proved entirely successful, the Allies laid a new minefield in the Cattegat and Baltic, so as to complete the blocking of all Germany's coastline both in the N. Sea and the Baltic as well as that of Dan. and Norwegian waters. On 14 April the pocket battleship *Admiral Scheer* was torpedoed by a Brit. submarine but not sunk. In the succeeding days Brit. submarines sank numerous Ger. supply ships and transports, notably off Narvik. In the 3 weeks from 7 April to 20 April there was intense naval activity in these waters, as is indicated by the losses on both sides. The Germans had 2 capital ships damaged, 3 and possibly 4 cruisers sunk, as well as the 7 destroyers lost in the Narvik actions, 30 transports and store-ships sunk, scuttled, or set on fire, with the loss of thousands of lives, and another 10 transports or store-ships were struck by torpedo and probably sunk. The R.N. lost 4 destroyers, 3 submarines, 1 sloop, and 5 trawlers; 5 other warships were damaged by air attack and 1 store-ship was sunk by a U-boat. From these figures it will be seen that the strength and efficiency of the R.N. were but little affected, but the damage to the Ger. Navy was so substantial as to alter the balance of naval power and to permit an important redistribution of the main allied fleets—a most valuable result in view of the fact that Italy was soon to declare war against the Allies.

In this period occurred the invasion of Holland when the bulk of the Dutch Navy, serving in European waters, succeeded in making their way to Brit. ports—like the Polish ships—to co-operate with the R.N. for the remainder of the war. These included 5 cruisers and a considerable destroyer and submarine force. The next exploit, in order of time, of the R.N., was the co-operation of the fleet with the R.A.F. in the evacuation of the Brit. expeditionary force from Dunkirk. (See under WESTERN FRONT IN SECOND WORLD WAR.) During the naval operations in connection with the withdrawal of the allied forces from Narvik,

the aircraft carrier *Glorious*, sister ship of the *Courageous*, was lost, together with 2 1350-ton destroyers, both the *Scharnhorst* and *Gneisenau* taking part in the action involving their loss. By now naval operations had been in progress against the Italians in the Mediterranean and very soon a number of their submarines were sunk by submarines or bombers; but the R.N. found it difficult to lure the It. fleet from its bases.

**British attack on French fleet.** By the terms of the Franco-Ger. armistice Fr. naval forces were to be demobilised, and had the Brit. Gov. taken no action the whole of the Fr. Navy would have passed into Ger. and It. hands for use against Britain. Under Churchill's lead the Cabinet decided on drastic action. The Fr. ships already in Portsmouth and Plymouth were at once taken under Brit. control. They comprised 2 battleships, 2 light cruisers, some submarines, 8 destroyers, and 200 small mine-sweeping and anti-submarine craft. But at Alexandria, where lay another Fr. fleet, the situation was more difficult, and it was only after some days that agreement was reached to demilitarise the ships. Had the Fr. commander disagreed his ships would have been sunk. Things were still more critical at Oran in N. Africa where lay a large Fr. fleet, including the finest of their battleships. At Oran and Mers-el-Kebir were the *Dunkerque* and *Strasbourg*—two of the most modern battleships in the world—2 other battleships, including the *Bretagne*, sev. light cruisers, and a number of destroyers, submarines, and other vessels. Adm. Somerville demanded that this fleet should either continue the fight against Germany and Italy, or sail with reduced crews to a Brit. port or to the W. Indies, or, if these alternatives proved unacceptable, that the Fr. commander should within 6 hrs sink his ships, failing which the Brit. admiral would use the necessary force to prevent the ships from falling into enemy hands. The parleys continued all day, but Adm. Gensoul, cowed by orders from Wiesbaden, rejected all alternatives. Before darkness fell Adm. Somerville opened fire on the Fr. fleet, which was protected by heavy shore batteries. The action lasted for only 10 min. and was followed by strong attacks from Brit. naval aircraft. The *Strasbourg* made off for Toulon, but was put out of action for a long time by Brit. torpedo attack. The *Dunkerque* was driven ashore, severely damaged, and attacked again later so as to ensure her virtual loss to the enemy, but eventually she too reached Toulon. The *Bretagne* was sunk, together with 2 destroyers. Heavy fire was directed on the Brit. ships but without damage. The It. fleet kept prudently out of the way. The net result of this tragic action was that of the 8 capital ships which France possessed at the time of the armistice between Pétain and Hitler practically all were prevented from being used by Germany against Britain. There was, of course, a furious outburst in Germany, for the action at Oran went far to redress what might have

been a serious adverse balance against Britain's naval power. A few days later (8 July) Brit. ships at Dakar, Fr. Senegal, took action against the *Richelieu*, the newly completed Fr. battleship. Terms having been refused, a Brit. naval officer dropped depth charges astern so as to damage the propeller and steering gear, and later aircraft attacked the ship with torpedoes.

'*Arandora Star*'—*Bartolomeo Colleoni*. In the same month (July) the Blue Star liner *Arandora Star* (15,500 tons), carrying 1500 Ger. and It. internees to Canada, was torpedoed and sunk by a U-boat in the Atlantic, about 1000 survivors being landed in Scotland. On 19 July H.M.A.S. *Sydney* (6850 tons), accompanied by a smaller destroyer force, won further laurels for dominion naval forces by sinking the It. cruiser *Bartolomeo Colleoni* (5069 tons) in the Mediterranean. The It. ship, with another cruiser, sped for her base, and being one of the fastest ships in the world's navies ought to have escaped. But accurate fire from the *Sydney* reduced her speed and enabled the destroyers to complete her destruction. In this month, too, a U-boat torpedoed and sank the *Meknes*, a Fr. merchant ship, off Portland, which was carrying 1280 Fr. naval officers and ratings for repatriation from England. There were only 400 survivors.

*British Mercantile Marine losses*.—The '*Jervis Bay*'. While the enemy's attention was almost exclusively devoted to the invasion of the N. neutrals, the losses of Brit. and allied merchant shipping sank to very low figures; but from then onwards the curve of destruction rose sharply, for the anti-U-boat craft employed on convoy escorts were progressively depleted. Hence it was all the more valuable to the allied cause to receive from the U.S.A. in Sept. some 50 old destroyers in return for the lease of defence bases in Brit. Atlantic ter. (W. Indies and Newfoundland). But the toll of losses continued to rise until, in Oct., it reached just over 400,000 tons, of which 300,000 tons were Brit. The losses then declined and averaged some 68,000 tons a week for the whole year. Their further substantial diminution, however, remained one of the chief problems facing the Brit. forces, especially as it was clear that the Ger. Gov. were bending their energies throughout the winter months to the construction of a great many more U-boats, in order to offset the advantage which Britain was obviously going to obtain from Roosevelt's Lease-and-Lend Bill by sinking cargoes of planes, guns, and tanks coming over the Atlantic. One of the Ger. pocket battleships at large in the Atlantic made an attack on 5 Nov. on some 38 ships in convoy, but all save 5 of them escaped, the immunity of the remainder being due to the gallant action of the armed merchantman *Jervis Bay* (Capt. E. S. Fogarty Fegan), which was accompanying the convoy and which, despite its greatly inferior armament, gave battle to the enemy against overwhelming odds and was of course, sunk. Fegan

went down with his ship and was posthumously awarded the V.C.

In the Mediterranean, where the collapse of France had left the Brit. Mediterranean fleet substantially inferior to the It. fleet, the balance was soon to be redressed in dramatic fashion. Brit. convoys and squadrons had continued to sail the sea at will, and every contact between the 2 navies ended with the precipitate retirement of the faster It. force. Engagements on various dates between June and Oct. had, however, already rather seriously reduced the It. Navy, when on 11 Nov., between Italy and Albania, a Brit. cruiser force came up with an It. convoy of 4 ships escorted by 2 destroyers. One was sunk, 2 set on fire, and one of the escort damaged before she could retire under the smoke screen she had put up for her own protection. The same night Fleet Air Arm aircraft, despite heavy anti-aircraft defences and balloon barrages, delivered a daring attack on the main It. fleet lying in Taranto. The new It. battleship *Littorio* and 2 of the *Cavour* class battleships were damaged so that they had to be beached to prevent their sinking, one of the latter so seriously that she was later abandoned. Two cruisers in the inner harbours were also damaged. The bulk of the fleet left the port, which till then had been its chief base, a few days later. At one stroke the It. battle fleet had been reduced from superiority over Cunningham's fleet to inferiority, even on paper. This was evident not long afterwards when the remnant of the It. fleet, consisting of the *Vittorio Veneto*—the other big new battleship—and a large number of cruisers and destroyers, on 27 Nov. encountered a Brit. force under Somerville—whose flagship was the *Renown*—S. of Sardinia. Once again the action took the form of a chase in which the Brit. ships naturally became strung out, the *Renown* leaving her heavier consorts far behind. But the It. ships were not to be caught and retired under smoke screens to the fortified port of Cagliari. That Adm. Cunningham's freedom of action was now greatly enhanced was shown decisively during the battle of the W. Desert, when his ships heavily bombarded It. positions at Bardia and Tobruk and elsewhere on the coast of Cyrenaica and thereby made an essential contribution to the hurricane Brit. victory (see AFRICA, NORTH, SECOND WORLD WAR, CAMPAIGNS IN). By this time, however, the hard-pressed Italians were receiving military aid from Germany in the form of bomber aircraft, which were based on Sicily. A major sea and air action was fought in the central Mediterranean on 10 Jan. 1941, when escorting ships of a convoy, passing through the Sicilian Channel and laden with much material assistance for Greece, were attacked by Ger. bombers. Two It. destroyers had been encountered earlier in the morning; one fled to safety, the other, heavily outgunned, fought courageously until she went down with all hands. Shortly after noon the new aircraft carrier *Illustrious* (23,000 tons) was heavily attacked by 15 Junkers dive-bombers of

the Luftwaffe, assisted by It. aircraft. The ship, though suffering damage and casualties, arrived safely in port, where she was repaired. The 9100-ton cruiser *Southampton* was also hit, and had to be abandoned. The Ger. and It. dive-bombers were heavily engaged by Brit. naval aircraft and 12 enemy planes were destroyed. The convoy emerged safely from the action and reached its destination. In the early morning of 9 Feb. ships of Force 'H' under Vice-Adm. Sir James Somerville, consisting of the battle-cruiser *Renown* and the battleship *Malaya*, the aircraft carrier *Ark Royal*, and the cruiser *Sheffield*, accompanied by light forces, bombarded military targets in Genoa, firing over 300 tons of shells into the port.

**Lofoten Islands raid.** The reality of sea-power and the value of the element of surprise in its operation were well exemplified on 4 Mar. when 10 enemy merchant vessels and an armed trawler were sunk and over 200 Germans taken prisoner, together with a number of Norwegian traitors, in a naval raid on the Lofoten Is. The main object of the raid, which was successfully accomplished, was to destroy the plant used for the production of fish oil for explosives, the whole of the output of which was absorbed by the Ger. masters of the is.

Material aid came from the U.S. Gov. in the spring of 1941 with the arrival in Brit. waters of 55 U.S. Navy submarine chasers and 18 mosquito torpedo-boats to join the Brit. Navy in hunting down the Ger. U-boats. These were the first of 99 U.S. warships scheduled for transfer to the Brit. Navy under Lease-Lend. Other ships included in the transfer were 17 over-age destroyers and 9 over-age submarines.

**Battle of Cape Matapan.** On 28 Mar. was fought an important naval battle in the Mediterranean when, some 100 m. to the SW. of Cape Matapan, Adm. Cunningham destroyed 3 heavy It. cruisers and 2 large destroyers, while another destroyer and a new battleship of the *Littorio* class sustained serious damage. The sole Brit. loss was that of one aircraft and its crew of two (see MATAPAN, BATTLE OF CAPE).

**Battle of the Atlantic—operations between April 1941 and 20 June 1942.** For several nights in the spring Brit. bombers made repeated attacks on the 2 Ger. battle-cruisers *Scharnhorst* and *Gneisenau*, which were sheltering in Brest harbour. Brit. planes repeatedly bombed the 2 ships, it being highly important to do everything practicable to reduce the great losses that were being sustained in what was called the battle of the Atlantic. Until the U.S.A. came into the war (Dec. 1941) the burden imposed on the R.N. was heavy in the extreme, for though Amer. ships conveyed supplies over part of the distance from Amer. ports it was some time before the protection was adequate enough to relieve the Brit. fleet from tasks which precluded action wheresoever Ger. or It. ships of war might be encountered. Even though Roosevelt had extended the 'combat zones' to the Mediterranean (June 1940) this protection could not in the

nature of things compensate Britain for the loss of the Fr. fleet. Yet even in the Mediterranean the R.N. was always on the alert. Thus on 21 April units of the Mediterranean fleet carried out a 45-min. bombardment of Tripoli, without either casualties or damage to the Brit. ships. In May, during the battle for Crete, the navy was engaged in most hazardous operations, their losses (3 cruisers, 1 anti-aircraft cruiser, and 6 destroyers) demonstrating the inability of surface ships to defend themselves in narrow waters unless they held the mastery of the air. The great event, however, of this time was the naval action which began off Greenland and ended some 400 m. off Brest, resulting in the sinking of the *Hood* and of the Ger. battleship *Bismarck*, 27 May (see further 'BISMARCK,' 'TIC' and 'HOOD,' 'THE'). About the same time the monitor *Terror* (7200 tons) and the equally famous gunboat *Ladybird* (625 tons) were lost in Ger. air attacks off the Libyan coast, both putting up a most spirited resistance before going down before overwhelming fire (see AFRICA, NORTH, SECOND WORLD WAR, CAMPAIGNS IN). The main event in June was the sinking by a Brit. submarine of the *Gorizia* (It. cruiser of 10,000 tons), the last of her class.

**Italian naval attack on Malta.** The first naval attack on Malta was made by a swarm of E-boats on 26 July. After an all-night bombing raid the It. E-boats were discovered off the is. at dawn. Brit. aeroplanes at once attacked, showering bombs on the intruders, while the Valletta coastal batteries opened an intense fire. The R.A.F. destroyed 4 E-boats, while the coast defences accounted for 5 more. It then appeared that the E-boats were acting as a cover for small torpedo-carrying craft, which tried to break into the harbour. Eight of them were blown up and none succeeded in entering the harbour.

**Enemy losses up to August 1941.** It may be noted that at this date the Admiralty estimated the enemy merchant shipping losses since the beginning of the war, by capture, scuttling, and sinking, at 4,007,000 tons (including 51 ships of 200,000 tons sunk by the Russians), this total being made up as follows: German, 2,321,000; Italian, 1,533,000; Finnish, 34,000; other ships in enemy control, 119,000. Also, from the outbreak of war up to Aug. 1941, 1118 enemy aircraft had been destroyed or damaged by ships' gunfire and naval aircraft, 537 being shot down into the sea and 581 damaged (203 believed destroyed). Of the 537 definitely destroyed, 348 fell to the guns of the fleet, 122 to naval aircraft, 55 to merchant ships, and 12 to allied warships.

**Convoy battles in the Mediterranean.**—The *'Ark Royal'* and *'Cossack'* sunk.—H.M.A.S. *'Sydney'* lost. In the Mediterranean again on 27-8 Sept. an important Brit. convoy beat off persistent attacks from the air. One merchant ship was damaged and had to be sunk. H.M.S. *Nelson* was hit by a torpedo but was not impaired. Thirteen enemy planes were

destroyed by Swordfish aircraft from the *Ark Royal* and by naval gunfire. On 8 Nov. an enemy convoy of 8 supply ships escorted by destroyers was sighted S. of Taranto by a Maryland aircraft, and a patrolling Brit. force under Capt. Agnew intercepted the convoy the following day, by which time it had been joined by 2 more merchant vessels and 2 more destroyers. Despite this disparity the Brit. force gave battle. Nine of the 10 supply ships were sunk and the tenth, a tanker, became a total loss, while 2 It. destroyers were sunk and 2 seriously damaged. In this month too were lost the destroyer *Cossack*, famous for the rescue of Brit. prisoners from the *Altmark* (Feb. 1940), the aircraft carrier *Ark Royal* off Sol-lum, and the old but reconditioned battleship *Barham*. A few weeks later (19 Dec.) the battleships *Queen Elizabeth* and *Valiant* were severely damaged at Alexandria by human torpedoes which had penetrated the harbour. Brit. submarines in the Arctic inflicted heavy losses on Ger. ships carrying supplies to the Murmanak front, the *Tigris* sinking 5 and the *Trident* 3 transports, many other vessels probably being sunk. Early in Dec. the famous Australian cruiser *Sydney* (7000 tons) was lost in action with a Ger. armed raider, *Stiermark* (9400 tons). The sole information concerning the action was obtained from the survivors of the Ger. ship, who numbered 330. The fight had evidently been at close range. After the *Stiermark* had been blown up the *Sydney* disappeared over the horizon and nothing more was heard of her.

'*Prince of Wales*' and '*Repulse*' sunk by Japanese aircraft. Disaster overtook the Brit. Far E. fleet very soon after Japan, without declaring war, launched simultaneous attacks, on 7 Dec., on Pearl Harbor and on Siam (Thailand) with a view to invading Brit. Malaya. On 10 Dec. Britain's newest battleship, the 35,000-ton *Prince of Wales*, together with the battle-cruiser *Repulse*, were sunk by Jap. bombers off Malaya, thereby profoundly altering the balance of naval power in the Pacific. The attacks were pressed home with the greatest determination, but the enemy aircraft had not to encounter fighter resistance such as the Germans and Italians encountered in similar attempts to sink battleships by bombs. The anti-aircraft defences of the 2 ships were certainly used to good effect, but this was not enough, though 7 planes were brought down, and the lesson of the importance of protecting the skies above the seas where the navy operated was once more painfully learned.

Japanese losses in merchant shipping. To counterbalance allied disasters by land and sea in the E., Amer., Brit., and Dutch planes and Amer. ships were early taking toll of Jap. shipping. On 15 Jan. 1942, for example, an Amer. submarine sank a 17,000-ton liner, and on the following day 3 merchant ships, off Tokyo Bay. This brought the tale of Jap. losses at the hands of Amer. forces in the Pacific to 35 vessels—14 being warships, including the 29,000-ton battleship

*Haruna*. Between 13 Dec. 1941 and 16 Jan. 1942 Dutch submarines and aircraft also sank 2 cruisers, 4 destroyers, and other ships. On 23 Jan. Dutch bombers attacked a large Jap. convoy which was trying to pass through the Macassar Straits between Borneo and Celebes, direct hits being scored on a battleship, 2 cruisers, a destroyer, and 4 transports.

The Amer. Navy won a considerable victory in an attack on the Marshall and Gilbert Is. on 11 Feb., their cruisers, carrier-borne aircraft, and destroyers sinking 16 Jap. vessels aggregating 100,000 tons. The importance of a progressive reduction of Jap. shipping of all kinds so early was evident when account was taken of the wide commitment of the Jap. warships operating thousands of miles from Japan, and the comparatively restricted shipbuilding potential in their yards.

Escape of '*Gneisenau*,' '*Scharnhorst*,' and '*Prinz Eugen*.' It was at this time (12 Feb.) that the Ger. pocket battleships *Scharnhorst* and *Gneisenau* and the 10,000-ton cruiser *Prinz Eugen* (see 'BISMARCK', THE), accompanied by destroyers, torpedo-boats, E-boats, and mine-sweepers, and well escorted by fighter aircraft, came out of Brest harbour and escaped through the straits of Dover to Germany. Visibility was poor and the enemy ships, which hugged the Fr. coast and were protected by screens of fighters from Fr. and Belgian airfields, which formed an 'umbrella' over the whole squadron, were never visible from the Brit. coast. In face of intense fire by the warships and fighter planes, Brit. coastal aircraft and Swordfish planes pressed home their attack on the squadron, 6 of the Swordfish being lost. The commander of the Swordfish squadron—Lt.-Cdr Esmonde—was awarded the V.C. (posthumous). No Brit. warship was lost, but public uneasiness at the escape of the Ger. ships, coupled with the disasters in the Far E., evoked a critical tone in the press and in the Commons.

Great naval battle off Java (27-8 February 1942). Late in this month there was a notable naval and air battle off Bali, exceeding in results even that of the Macassar Straits, Dutch and Amer. warships inflicting heavy losses on a Jap. invasion fleet. Another naval battle was fought on the night of 27-8 Feb. off the N. coast of Java but with severe loss to the Allies. In this action an allied force consisting of the Brit. cruiser *Exeter* (8390 tons), the Australian cruiser *Perth* (6830), the Amer. cruiser *Houston* (9300), the Dutch cruisers *De Ruyter* and *Java* (each 6000 tons), commanded by Adm. Doorman in the flagship *De Ruyter*, and accompanied by 1 Dutch and 3 Brit. destroyers, made contact with the Jap. ships half way between Surabaya and Bawean Is., the Jap. force comprising sev. cruisers, some of 10,000 tons, and 13 destroyers, organised in 2 flotillas. The Dutch destroyer *Kortenaer* was soon sunk; the *Exeter* was hit in the boiler room and dropped out of the line; the Brit. destroyer *Electra*, joining in a counter-attack, disappeared into an enemy smoke screen

and was not seen again. Later the enemy broke off the action under a smoke screen, but shortly afterwards, near Rambang, 2 enemy cruisers were seen and battle was again joined (1 Mar.), when both the *De Ruyter* and the *Java* were hit simultaneously, blew up, and sank. A similar fate seems to have befallen the *Perth* and *Houston* not long afterwards. The *Ezeler*, her speed considerably reduced, the Brit. destroyer *Encounter*, and the Amer. *Pope* were all sunk later by 3 Jap. cruisers. In all the Allies lost 5 cruisers, 7 destroyers, and a sloop (*Varra*, Australian), against the Jap. loss of a 10,000-ton cruiser and 1 small cruiser for certain and probably 4 destroyers, while all the other cruisers were set on fire.

*The battle of Sirte.* Reverting again to the Mediterranean, the same month saw another successful convoy action (22-4 Mar.). A Brit. convoy, with supplies for hard-pressed Malta from Egypt, with the protection of a 6-in. gun cruiser, anti-aircraft cruisers, and destroyers under the command of Rear-Adm. Vian of *Cossack* fame, sighted and drove off 4 Lt. cruisers without loss to convoy or escort. Later the battleship *Littorio*, 2 8-in.-gun cruisers and 4 6-in.-gun cruisers, and some destroyers were sighted and, despite the disparity in strength, action was joined, a torpedo hit being scored on the *Littorio*, which was also hit by a Brit. cruiser's gunfire. Other It. ships were also hit and the enemy force, thrown into confusion, withdrew.

*Further losses in Far East.* *Battle of the Coral Sea.* In April further Brit. losses were sustained in the Far E., the cruisers *Dorsetshire* and *Cornwall* (each 10,000 tons) being lost through Jap. air attack in the Indian Ocean. About the same time the carrier *Hermes* was sunk off Trincomalee (see also AIRCRAFT CARRIER). But what was up to this date perhaps the biggest naval battle since Jutland—the battle of the Coral Sea—was fought (4-8 May) off the Solomon Is., some 1000 m. from the coast of Queensland, between Amer. and Australian naval forces and the Jap. fleet. This action certainly saved Australia from an immediate attempted invasion. The allied fleet and planes first sank a Jap. light cruiser, 2 destroyers, 4 gunboats, and, later, an aircraft carrier, 3 heavy cruisers, 1 light cruiser, and 2 destroyers—a total of 15 warships sunk, and a grand total of 37 ships sunk, damaged, or probably sunk. The Americans lost 1 aircraft carrier, 1 destroyer, and 1 tanker. This great naval and air battle temporarily ceased on 9 May. It represented the continued effort by the Japanese to extend their conquests towards the S. and SE. Their first efforts were aimed at expanding their air bases, but the Allies' air forces had so effectively bombed their landing fields that Japan's plans were frustrated. In this battle of the Coral Sea the issue was decided between aeroplanes flown from the opposing aircraft carriers.

*The battle of Midway Island.* The battle of the Coral Sea was a new kind of conflict and the experience was to be

repeated a month later in the important battle off Midway Is., the Amer. naval base 1300 m. NW. of Hawaii, when Amer. navy and army pilots from both shore bases and carriers dealt the blows which repelled attack by a powerful Jap. fleet, thereby confirming the significance of the naval revolution which had transformed warfare at sea. In the Midway battle 4 Jap. aircraft carriers were sunk, each with a complement of 1500 men. At least 3 transports, carrying 6000 troops, were torpedoed and sunk. This was the worst defeat in Japan's naval hist., for the spearhead of her naval and air striking power was broken by the loss of half her best aircraft carriers and she had now lost at least 6 of the 11 or more of the fully effective fleet of carriers with which she began the Pacific war. At least 200 planes, together with their trained personnel, went down with the carriers lost at Midway. For this victory the Amer. Flying Fortresses, which repulsed and scattered the Jap. naval forces, were chiefly responsible. While the immediate results of these 2 battles was the removal of the Jap. threat to America's forward naval bases in the Pacific, the ultimate result was to shift the balance of naval power in the Pacific from its extremely one-sided bias in favour of Japan.

*Hazards of Mediterranean convoys.* During this period convoying in the Mediterranean had grown increasingly hazardous—more so even than to Murmansk; for Britain had lost the command of the sea in these narrow waters of the Mediterranean over which Nazi planes could operate freely from Sicily, Crete, and elsewhere. Consequently the problem of sending supplies to Malta and Libya became greatly aggravated and the ill fortune which awaited an important double convoy at this time had a most deleterious effect on the Eighth Army's battle against Rommel's army May-June 1942 (see AFRICA, NORTH, SECOND WORLD WAR, CAMPAIGNS IN). It had been decided to sail in 2 convoys so as to disperse the enemy's efforts to concentrate his attacks. The W. convoy got to Malta after destroying over 60 enemy planes. The E. convoy, under Rear-Adm. Vian, was also steering towards Malta when a force of It. battleships, cruisers, and submarines tried to intercept it; and eventually, owing to the exhaustion of anti-aircraft ammunition, Rear-Adm. Vian decided to return to Alexandria. The R.N. in these 2 convoy attacks lost 1 light cruiser and 4 destroyers; the enemy had 1 battleship torpedoed and 1 8-in. gun cruiser, 2 destroyers, and 1 U-boat sunk.

*Naval operations, July-December 1942.* During this period the most outstanding event in the W. was the allied landing in N. Africa on the night of 7-8 Nov. Until forces were ashore the responsibility for the operation lay in the hands of the navy, whose success was measured by the fact that the initial convoys arrived at the right time in the right place practically unscathed. The only damage was 1 Amer. ship torpedoed, but all her troops were landed without loss. Until the



U.S.A.A.F. and R.A.F. were able to operate from captured airfields the Fleet Air Arm provided not only protection to the ships, but also tactical reconnaissance for the army ashore. Thereafter the allied navy continued to keep the armies supplied and reinforced in the face of heavy U-boat concentrations, and maintained the offensive at sea against enemy forces. Meanwhile important naval operations were taking place in the S. Pacific. With the defeat of the Japanese at the Coral Sea and Midway Is. battles, the initiative passed to the Americans, and on 7 Aug. Amer. marines landed in the

manœuvred so as to intercept the Jap. ships. The resulting action took place off Savo Is. between the is. of Guadalcanal and Florida. The smaller Amer. ships attacked the Jap. battleships of the *Kongo* class at point-blank range. Their leaders, Rear-Adms. Daniel Callaghan and Norman Scott, were killed, but the Jap. force was heavily damaged and disrupted. The next night there was another clash between surface ships, 2 Amer. battleships of the new *North Carolina* and *South Dakota* class taking part. This was the biggest naval battle of the war up to that time, and the Jap. losses were



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TRANSPORTS LYING OFF GIBRALTAR: PART OF THE GREAT ALLIED NORTH AFRICA EXPEDITION

Solomon Is., seizing the harbour of Tulagi. Though taken by surprise, the Japanese sent cruisers and destroyers to attack on the night of 8-9 Aug. and they had decidedly the best of the battle. H.M.S. *Canberra* and the U.S. cruisers *Quincy*, *Vincennes*, and *Astoria* were sunk. The Japanese escaped with little damage; but the Allies achieved their object, since the Japanese were unable to interfere with the transports. Every subsequent Jap. attack on the Solomons was decisively repelled with heavy loss in transports. There was a major naval action, which raged for sev. days in Nov., particularly on 12-15 Nov., between surface ships, off the Solomons. It was precipitated by a strong Jap. attempt to reconquer a vitally important beach-head on Guadalcanal (q.v.). A large Jap. fleet of transports steamed southward from the Shortland area. Strong reinforcements for Amer. land troops had just been landed in Guadalcanal and the Amer. cruiser and destroyer screen covering the landing was

1 battleship, 3 heavy cruisers, 2 light cruisers, 5 destroyers, and 8 transports sunk, and 1 battleship, 6 destroyers, and 4 cargo transports damaged. The Amer. losses were 2 light cruisers and 7 destroyers sunk.

It was during this period that the Fr. fleet at Toulon was scuttled. Following on the landing of Brit. and Amer. forces in Fr. N. Africa in Nov., Ger. forces entered Toulon. But the Fr. warships in the port were immediately scuttled by their crews. The battleships there were the *Dunkerque* and *Strasbourg*, each 26,500 tons, 1 old battleship, the *Provence*, 4 10,000-ton cruisers, 3 light cruisers, 1 seaplane carrier, and some 28 destroyers (6 Nov. 1942).

The navy continued throughout to provide escorts for the numerous convoys to Russia, Malta, the Persian Gulf, and elsewhere. One outstanding event was the successful passage of a large convoy to Russia on New Year's Eve, 1943. All the merchant vessels reached Russia safely,

but the destroyer *Achates* was lost and the *Onslow* damaged. The Brit. destroyers were commanded by Capt. R. St. V. Sherbrooke (awarded the V.C.), whose escort was attacked by a greatly superior Ger. force consisting of a pocket battleship (*Lützow*), a cruiser (*Hipper*), and 6 destroyers. The action was fought in snowstorms and in semi-darkness off the N. Cape, Norway. It appears that the admiral commanding the Ger. task force mistook the 2 Brit. cruisers *Kent* and *Jamaica*, which had come to the assistance of the convoy, for the vanguard of a battle squadron. He therefore broke off the action and retired in accordance with previous orders.

N.E. of Finschafen and in Huon Gulf, off New Guinea, on 2-4 Mar., a large Jap. convoy of 12 transports and 10 warships (cruisers and destroyers), representing an aggregate tonnage of 90,000 tons, was completely wiped out, together with more than 80 Jap. planes. The ground forces, estimated at 15,000 men, who were destined for an attack on the Allies in New Guinea, were killed to a man. The Allies' total loss was only 1 bomber and 3 fighter aircraft, while a few other planes were damaged. This victory of the Bismarck Sea was so complete as to amount to a major disaster to Jap. arms and seacraft, besides demonstrating the superiority of allied fighter aircraft and pilots over the Japanese.

It may be mentioned here that by the end of Jan. 1943 aggregate Brit. losses (as stated in the Commons, 4 Feb.) were as follows: capital ships, 5; aircraft carriers, 7; cruisers, 25; armed merchant cruisers, 14; destroyers, 94; corvettes, 14; submarines, 44; monitors, 1; sloops, 8; mine-sweepers, 22; trawlers, 156; drifters, 14; mine-layers, 1; yachts, 3; gunboats, 5; cutters, 3. But in spite of losses the fleet was much stronger at that date than it was a year previously, and indeed during these 3 years of the war no fewer than 900 vessels of various classes had been added to the R.N. The ships lost in these 3 years by Germany, Italy, and Japan were: Germany, 1 battleship, 1 pocket battleship, 4 cruisers, 39 destroyers and torpedo-boats, 4 raiders, and 69 other miscellaneous warships, minesweepers, and small craft. Italy, 10 cruisers, 48 destroyers and torpedo-boats, and 35 other miscellaneous warships, etc. Japan, 2 battleships, 6 aircraft carriers, 17 cruisers, and 70 destroyers.

*Naval operations, 1943.* The most significant feature of sea operations in 1943 was the gradual reduction of the Ger. submarine menace. In the months May-July 1943 the Allies sank 90 U-boats. In the first 6 months of the year the number of ships sunk per U-boat operating was only a quarter that in the first half of 1942. Moreover during the first half of 1943 new ships completed by the Allies exceeded sinkings from all causes by more than 3,000,000 tons. Before the descent upon Sicily an armada of warships, troop transports, supply ships, and landing craft proceeded through Atlantic and Mediterranean waters, with scarcely

any interference from U-boats. Over 2500 vessels were involved in these latter operations and the losses were only about 80,000 tons. In the months Aug.-Oct. approximately 60 U-boats were destroyed. This brought the total Ger. losses since Sept. 1939 to between 700 and 800 submarines. The loss of 150 submarines in the 6 months May-Oct. 1943 meant a loss of 6000 trained men of the submarine service, a fact which was found to have a profound effect on the morale of the crews.

Following the collapse of It. resistance after the conquest of Sicily the It. Navy surrendered under the terms of the armistice with Marshal Badoglio. On 11 Sept. the prin. ships of the It. Navy—4 battleships, 6 cruisers, and 7 destroyers—which had sailed from Spezia, came into Valletta under the escort of 2 Brit. battleships and a destroyer screen. Together with smaller ships, the total was 30. One uncompleted battleship fell into Ger. hands. When the fleet started from Spezia it had another capital ship with it, the *Roma*, but this ship was sunk by Ger. bombers as the fleet proceeded southwards. The result of this surrender and of the allied victories in N. Africa was that the R.N. once again completely dominated the Mediterranean with the great strategic advantage of greatly shortened sea routes.

Brit. midget submarines carried out a daring attack on main units of the Ger. battle fleet in their protected anchorages in Alten Fjord, N. Norway, on 22 Sept., inflicting severe underwater damage on the battleship *Tirpitz*. The attack involved extreme hazards and 3 of the submarines were lost, but the attack as a whole was successful. The submarines had to penetrate a highly defended base and, to do so, they had to pass through the minefields guarding the approaches to the anchorage; and, after negotiating the intricate fjords, always vigilantly patrolled by the Germans, had to carry out an attack in the strongly protected and confined waters where the ships lay moored and, finally, to regain their base, the same obstacles had to be overcome.

In the S. Pacific there was no great naval battle between the Allies and the Jap. fleet during 1943, but there was considerable activity on both sides in convoy work and in covering landings and, generally, in combined operations. Amer. warships co-operated effectively with the allied air forces in covering the allied landing near Lae in Huon Gulf, New Guinea, in Sept. 1943. A remarkable feature of these operations and others of subsequent months was that the Jap. Navy made no attempt to interfere with the Allies, a fact which probably meant that their previous losses were straining their resources. On 4 Nov. 2 heavy Jap. cruisers and 3 destroyers were sunk, and many others probably sunk, in a devastating raid on enemy shipping of all kinds in Rabaul harbour. This was the heaviest loss inflicted on the Japanese in this area since the battle of the Bismarck Sea (see further PACIFIC CAMPAIGNS IN SECOND WORLD WAR).

The outstanding naval event of the year

was the sinking of the 26,000-ton Ger. battleship *Scharnhorst*. She was brought to action off the N. Cape, Norway, on 26 Dec., when cruisers and destroyers supported the battleship *Duke of York*, under the command of Adm. Sir Bruce Fraser, in sinking her, the whole of the main action, which started in the late afternoon in the half-light of the Arctic dawn, being fought in the dark with the aid of radiolocation and starshells. Some 36 survivors of a crew of over 1400 were picked up, the Brit. casualties being 17 killed and no ships lost. The loss was a severe blow to Germany, for it was on the *Scharnhorst* that she relied to prevent vital supplies reaching Russia at a particularly critical stage of the campaign on the E. front.

In the Bay of Biscay on 27-8 Dec. 3 of 11 Ger. destroyers, which had emerged to convoy a Ger. blockade-runner, were sunk by the 2 Brit. cruisers, *Glasgow* and *Enterprise*. The blockade-runner had been intercepted earlier by a Coastal Command (q.v.) aircraft, which set her on fire with bombs so that she was abandoned in flames. It was soon after dawn on the following day that a Liberator of the U.S. Navy sighted the 11 Ger. destroyers about 200 m. from the spot where a Czech Liberator had bombed the blockade-runner to destruction. This Ger. force consisted of 5 modern *Narvik* class destroyers with five 5.9-in. guns and six *Elbing* class destroyers with four 4.1-in. guns—eloquent evidence of the importance to Germany of the blockade-runner's cargo, which probably contained Malayan rubber from the Jap. occupying authority.

*Naval operations, 1944.* The chief naval event in 1944 was the Jap. defeat in the last week of Oct. during the Amer. invasion of Leyte Is. (19 Oct.). This menacing invasion of the Philippines tempted the Jap. Navy to emerge and risk an attack on Halsey's Third Fleet which, sailing westward across the Pacific, had already taken the Marshall, Mariana, and Palau Is. on the way and was now acting as general cover to the allied land operations; and also on Vice-Adm. Kincaid's Seventh Fleet, whose role was that of escort and close support of the military force on Leyte Is. On 22 Oct. ships of the Third Fleet took up positions E. of the Surigao and San Bernardino Straits—the only passages through the Philippines—further N. off the Polillo Is., and E. of Luzon, as cover against any Jap. forces that might approach from those quarters. The Seventh Fleet continued in close support of the landing in Leyte Gulf, opening off the Surigao Strait. Next day Amer. carrier aircraft saw 3 Jap. forces approaching, 2 from the W. and 1 from the N. The first, coming through the Sulu Sea directly towards Surigao Strait, comprised 2 old battleships, 3 heavy cruisers, 1 light cruiser, and 8 destroyers; the second, a stronger force, steaming through the Sibuyan Sea towards San Bernardino Strait, comprised 2 new battleships, 1 fairly modern battleship, 2 old battleships of the *Kongo* class, 2 light and 10 heavy cruisers, and 15 destroyers. The

third squadron, coming from Japan, was seen 400 m. N. of Leyte Gulf, and comprised 1 large and 3 light aircraft carriers, 2 old battleships, 3 light cruisers, and 8 destroyers. In the morning of 23 Oct., before the approach of this third enemy squadron was known, Amer. carrier-based planes attacked the other 2 enemy squadrons, while Jap. land-based planes attacked Adm. Halsey's carriers cruising to the eastward. In this cross-air attack the Japanese lost 150 planes to the Americans' 8, but succeeded in hitting a light Amer. carrier which blew up and had to be sunk, the majority of the crew being saved. Amer. torpedo-plane attacks were concentrated on the Jap. force in the Sibuyan Sea and sank 1 light cruiser outright and damaged a number of other vessels, but the bulk of this Jap. squadron went on through the San Bernardino Strait during the ensuing night. The Jap. squadron in the Sulu Sea was attacked by bombers and fighters only and many ships were hit, but this squadron too held on its course, entering the Surigao Strait at night. Here it was engaged by the Seventh Fleet and completely defeated, one if not both its battleships, sev. cruisers, and most of the destroyers being sunk, for the Amer. loss of only a few motor torpedo-boats. The survivors of this Jap. squadron turned tail and retreated westward through the Sulu Sea again, but were sunk to the last ship by air attacks the next day. Prior to these nocturnal events the Americans had learned of the approach, from the N., of the Jap. carrier force and Adm. Halsey at once sent a number of his carriers to meet the enemy carriers at dawn on 24 Oct. This attack achieved complete surprise. The largest carrier and 2 of the 3 smaller ones were sunk outright by Amer. air attacks, which also sank a destroyer and crippled a cruiser and the third smaller carrier. Of these the cruiser was sunk the next night by submarine, while the remaining Jap. carrier was trapped and also sunk, together with another carrier which had escaped damage from the air, by the guns of Amer. cruisers and destroyers. Both enemy battleships of this carrier fleet were hit by bombs and one also by torpedoes as well; all the remaining cruisers and destroyers were hit by bombs and gunfire. No Amer. ship was hit in this action in the N. Halsey's carrier-borne aircraft then turned S., being now more urgently needed there than in the N. Meanwhile the Jap. Sibuyan Sea squadron, having passed the San Bernardino Strait and turned S. round Samar Is., came in contact with some of Kincaid's carriers and sank 2 of them by gunfire. But the enemy was then brought to action by Kincaid's fleet fresh from its night victory in the Surigao Strait, with which Halsey's carrier-borne aircraft, hurrying back from the N., now co-operated. Every Jap. ship was badly damaged, 1 heavy cruiser being sunk and a destroyer disabled, while the remainder of the squadron turned back through the strait, 1 straggling cruiser being sunk by pursuing Amer. cruisers. Next day carrier

aircraft from both Amer. fleets—together with Gen. MacArthur's shore-based aircraft—kept up the attacks on the westward retreating Japanese, sinking 2 more cruisers and (probably) 1 battleship. In all 3 battleships, 4 carriers, 6 heavy cruisers, 4 light cruisers, and 7 destroyers were sunk; while 4 battleships, 5 heavy cruisers, 1 light cruiser, and 2 destroyers escaped in a damaged condition. Amer. losses were 1 light carrier, 2 escort carriers, 2 destroyers, 1 destroyer escort (equivalent of a frigate), and a few lesser craft sunk; 8 escort carriers, 2 light cruisers, and 5 destroyers were damaged.

Another notable event was the sinking of the last great Ger. battleship, *Tirpitz*, by R.A.F. Lancasters on 12 Nov. Some 29 Lancasters, led by W. Cdr J. R. Tait and Sqdn-Ldr A. G. Williams, attacked the ship in Tromsø Fjord with 12,000-lb. bombs. There were sev. direct hits and within a few minutes the ship capsized and sank. This final attack was the climax of a long series, which had probably disabled the ship as a fighting unit, though air observation did not definitely establish that fact. On her first appearance at sea on 9 Mar. 1942, a torpedo from an aircraft of the Brit. carrier *Victorious* off the Lofoten Is. sent her back to harbour for repair. Refitted she attempted to attack a Russia-bound Brit. convoy on 8 July 1942, but was hit by sev. torpedoes from a Russian submarine. She succeeded in reaching an anchorage prepared for her in the Alten Fjord, but was unable to leave for 14 months. In Sept. 1943 she joined the *Scharnhorst* in action against the very small Norwegian batteries in Spitzbergen, returning quickly to her lair for fear of a possible Brit. attack. There she was once more severely damaged, this time by the torpedoes of midget Brit. submarines. In April 1944, when seen to be capable of moving again, the period of air attacks on her began. Numerous hits by home fleet bombers, including at least 3 with heavy bombs, put her out of action for another 5 months. Bomber Command then took up the task with a succession of attacks on 15 Sept., 29 Oct., and 12 Nov., the last being the only time that the attackers were able to see the ship properly. One 12,000-lb. bomb hit her amidships, another in the bows, and a third near the stern. The ship heeled over rapidly and capsized with 700 ft of her keel sticking out of the water.

The U-boat menace was very greatly reduced in 1944—so much so that in 1 month of the year only 1 ship was lost, while in sev. other months the number sunk was negligible. Up to the middle of the year the Germans had lost since the beginning of the war more than twice as many U-boats as in the First World War, the total up to Aug. 1944 exceeding 500—the war memorial at Kiel recorded the loss during the First World War of 193 U-boats. In one month of 1944 (July) the number of U-boats destroyed was substantially greater than the number of merchant ships sunk by them. In Mar., 5 Brit. sloops on escort duty destroyed 6 Ger. submarines in the space of 20 days,

in one case capturing the whole crew of 51 of one large U-boat. Some 17 U-boats were sunk while attempting to interfere with the Anglo-Amer. cross-Channel traffic since the first landing of the Allies on the beaches of Normandy. While the Ger. U-boat fleet was then still of impressive size, the U-boats were now the hunted rather than the hunters; for they had been attacked from the Arctic to the Indian Ocean, aircraft playing a great part, together with surface forces. This pressure was maintained until all chances of revival of the U-boat campaign were killed, and this despite the development of new devices and methods by an ingenious and scientific enemy.

*Naval operations in European theatre of war in 1945.* *'Admiral Scheer'* and *'Lützow'* sunk. The Ger. pocket battleship *Admiral Scheer* was sunk in an attack on Kiel by aircraft of the R.A.F. Bomber Command on the night of 9 April 1945. She was turned completely upside down in much the same position as the *Tirpitz* in Tromsø Fjord. She was the second of the 3 pocket battleships to be put out of the war, the first being the *Admiral Graf Spee*. Germany's last pocket battleship, the *Lützow*, was sunk on 16 April by a small force of Lancasters in an attack with 12,000-lb. bombs at Swinemünde. Like the *Admiral Scheer* the *Lützow* was used for commerce-raiding early in the war, and later moved to Norwegian harbours for use against Brit. convoys to Russia. She was torpedoed by a Brit. aircraft off the Norwegian coast in June 1941 and again by midget submarines in Alten Fjord in Sept. 1941.

*German ships captured in the port of Copenhagen.* The last 2 big Ger. warships still seaworthy at the end of the European war, the cruisers *Prinz Eugen* and *Nürnberg*, were found by Brit. cruisers lying in the N. port, Copenhagen, with their Ger. crews on board. With them were 3 destroyers, 2 torpedo-boats, 10 minesweepers, 13 'flak' ships, 19 armed trawlers, and 2 armed merchant ships. Altogether about 135 warships of various types and some 600,000 tons of merchant shipping were captured in Copenhagen, which in the later period of the war was used extensively by the Germans for troop transport to Norway and for the evacuation of wounded from the Russian front.

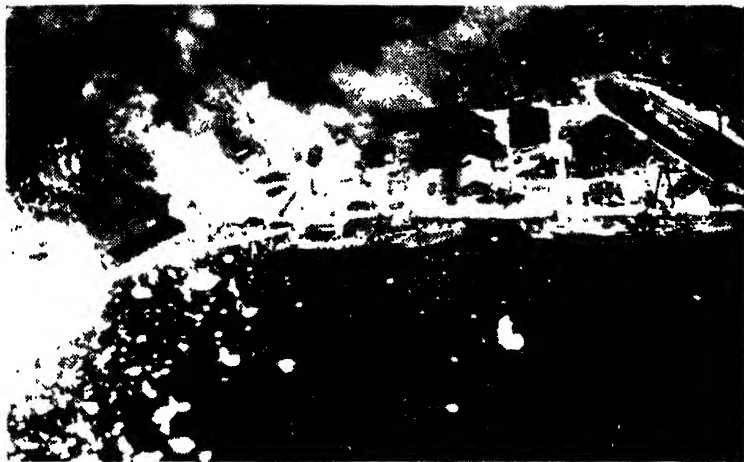
*Toll of midget U-boats.* During the closing months of the war the Ger. Navy made extensive use of midget U-boats in a determined but vain attempt to interrupt the flow of allied supplies across the Channel and the N. Sea to the Continent. In the course of a series of actions, fought mainly in coastal waters, some 81 midget U-boats were either sunk or captured. After the capitulation of Germany about 100 more midget U-boats were captured.

*Summary of U-boat losses in the battle of the Atlantic.* With the surrender of Germany the grim battle of the Atlantic ended. It had been a long-drawn, relentless struggle extending over nearly 6 years and one which demanded not only

the utmost courage and endurance, but also the highest scientific and technical skill. Losses were heavy both in lives and materials and, at the peak in 1941 and 1942, the issue of the struggle hung in the balance. On the other hand 662 U-boats were destroyed and many others were destroyed by the Germans themselves in the final stage. Most of these successes were achieved by the combined allied naval and air forces working in the closest co-operation; some were due to mines laid from aircraft and ships; others to bombing in harbour; and a few U-boats were lost by marine perils.

transatlantic passages, independent of convoy protection.

*British submarines in the war.* During the war Brit. submarines caused the following enemy losses: 6 battleships damaged; 6 cruisers sunk and 15 damaged; 12 destroyers sunk and 18 damaged; 46 U-boats sunk or probably sunk; 112 minor war vessels sunk and 26 damaged. That is the summary against warships alone, but the part played by Brit. submarines was often concerned chiefly with the interruption of the flow of reinforcements and supplies to enemy forces overseas. In this form of warfare Brit.



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#### THE LAST BLOWS AT JAPAN

An effective attack by naval Avengers on Shimonoseki shipyard,  
Ino Shima, Inland Sea.

Up to 1943 the rate of shipping destroyed in the battle of the Atlantic in relation to the number of U-boats lost had been very favourable to Germany, but in the first 4 months of 1943 allied counter-measures began to make themselves felt and U-boat losses mounted rapidly. R.A.F. Coastal Command and escort carriers of the R.N. provided air cover on a scale which could not be matched by the Germans, and in April the allied chiefs of staff initiated a series of combined sea and air offensives directed against U-boats in the Bay of Biscay. Doenitz (q.v.) was to be attacked in his own waters. The result of these and other allied operations was that, in the month of May 1943, 37 U-boats were sunk, representing approximately 30 per cent of all U-boats at sea. Doenitz was forced to withdraw his U-boats from the N. Atlantic, and on 24 June allied ships of 15 knots or over were able to resume

submarines sank 1373 enemy supply and troopships, totalling 2,100,000 tons, and damaged a further 263 ships in these classes, with a tonnage of 790,000 tons.

*British naval losses in the war against Germany and Italy.* The Brit. Navy lost 730 ships during the war in the W., and the dominions 46 others. Brit. losses included the capital ships *Royal Oak*, *Hood*, *Prince of Wales*, *Repulse*, and *Barham*, and the aircraft carriers *Courageous*, *Glorious*, *Ark Royal*, *Audacity*, *Hermes*, *Eagle*, *Avenger*, and *Dasher*. There were also lost 134 destroyers, 77 submarines, 23 cruisers, 51 mine-sweepers, and 48 drifters, but numerically the highest losses were 240 trawlers. These totals do not include light coastal craft, and landing ships and craft. Losses of naval ships, of all sizes and sorts, amounted to 3282.

*Allied mercantile marine losses in the war against Germany.* During the war

some 4280 allied merchant ships, totalling 19,720,000 gross tons, were lost by enemy action. Of these, 2570, totalling 11,380,000 tons, belonged to the Brit. Empire. Neutral countries lost 490 ships, totalling 1,420,000 tons. U-boats accounted for 2770 ships, of which 1360 were British, 440 American, 670 other allied, and 300 neutral. There were 520 ships lost through mines, including 340 British and 15 American. The total losses through attacks by surface raiders were 330—including 210 British and 13 American. Hostile aircraft sank 750, of which 440 were British and 58 American. Some 400 vessels, including 220 British and 12 American, went down through other or unknown causes. Altogether the U.S.A. lost 538 ships, totalling 3,310,000 tons, and the other Allies, excepting the empire, 1172 ships, totalling 5,030,000 tons. In addition the Brit. Empire lost 610 ships of 1,120,000 gross tons. Losses of It. ships after Italy became a co-belligerent are included in these figures. Fr. ships are included up to the collapse of France in June 1940. After that date Free Fr. ships are included, but not Vichy ships.

*American troop losses at sea.* Ship sinkings or damage to ships cost the lives of 3604 Amer. soldiers in the war against Germany and Italy, i.e. in the African, Mediterranean, European, and Atlantic areas, but excluding casualties suffered during the invasion landings. Official returns show that of 4,453,061 Amer. troops who embarked in the U.S.A. for Europe, 1094 were lost at sea outbound. This comparatively small loss was due to the work of the allied navies, the vigilance of convoy escorts, and to the skill of the gun crews on the transports. The sinking involving the heaviest loss was that of the *Rohna*, a Brit. troopship, sunk by air attack in Nov. 1943 off Djidelli, Algeria, with the loss of 1015 men.

*Naval operations in the Far East in 1945.* The beginning of the year saw the U.S. Navy actively supporting the recapture of the Philippines. In the bombardments previous to the landings in the Lindayan Gulf on 9 Jan., Australian naval forces took part with those of the U.S.A. On 16 Feb. the Amer. advance across the Pacific reached the mainland of Japan when a naval force moved up to within 300 m. of Honshu and subjected Tokio and Yokohama to 9 hrs' bombing by 1500 aircraft from about 20 carriers. This was followed by 2 further heavy raids towards the end of the month, when naval aircraft were supported by 200 Superfortresses. Meanwhile on 19 Feb. Amer. forces assaulted the is. of Iwo Jima with massive naval and air support, but the is. was not won until 16 Mar., at the cost of 20,000 Amer. casualties, including over 4000 killed. The Brit. Pacific fleet now began to operate as a separate Brit. unit under Amer. command. It included 5 capital ships and 4 large carriers, besides numerous cruisers, destroyers, and other craft, and one of its first operations was an attack with Amer. naval aircraft on is. between Formosa and Japan. Attacks by

1500 allied aircraft were also made on the Jap. fleet in its home waters. On 1 April, in the largest amphibious operation up to date, troops landed on Okinawa after a crushing naval bombardment and under an air umbrella of 1500 aircraft. The left flank was covered by a powerful Brit. naval force. In strong counter-attacks, the allied fleet suffered loss and damage from Jap. suicide aircraft. Meanwhile a fast Amer. task force brought a Jap. naval force under air attack, sinking the battleship *Yamato*, and Brit. carrier aircraft attacked Formosa. Throughout May hard fighting continued at Okinawa which was not finally captured until 21 June. This gave the U.S. Air Force a base only 325 m. from the Jap. mainland. In the SW. Pacific Australian forces, supported by allied naval units, had landed in N. Borneo and New Guinea, to be followed in June by the capture of Labuan Is. On 14 July Japan itself was subjected to the first naval bombardment when Amer. warships poured 1000 tons of shells into the port of Kamaishi (Honshu). Thereafter bombardments by Brit. and Amer. surface forces alternated with joint attacks by as many as 1500 naval aircraft. Towards the end of the month Brit. and Amer. air attacks were concentrated on the remnants of the Jap. fleet sheltering in the Inland Sea and, in 3 devastating assaults, did immense damage both to ships and shipyards. Shattering sea and air bombardments of the mainland continued in Aug. and were quite independent of the atomic bombs dropped on 6 and 9 Aug. On 15 Aug. allied aircraft were starting a further attack in the Tokio area when the cease fire order was received. Japan had surrendered. On 27 Aug. a large allied fleet, under the supreme command of Adm. Halsey, U.S. Navy, arrived in Sagami Bay and Adm. Sir Bruce Fraser signalled to the Admiralty: 'The fleet has anchored in Japanese waters.' Of the Jap. Navy there remained afloat only 1 battleship out of 13, and that was damaged, 2 severely damaged aircraft carriers out of 21, 4 damaged cruisers out of 40. Jap. destroyers had been reduced from 165 to 26, and her submarines from 140 to 16. No fleet had ever been more thoroughly defeated.

*The navy's sacrifice.* In the whole course of the war nearly 51,000 officers and men of the R.N., excluding the navies of the dominions and the Royal Marines, were killed or missing. This number exceeded by over 20,000 the numbers killed in the First World War.

The more spectacular victories and successful actions fought at sea were really but a small part of the R.N.'s great contribution to the overthrow of Nazi tyranny; its real task lay in the unceasing vigilance, devotion, and toil that went to the maintenance of the sea communications of the empire and Allies throughout the war. The navy's losses in this war were two and a half times as great as they were in the First World War, and losses of merchant shipping amounted to the figure of 20,000 tons a day for most of 1942. The magnitude of

the navy's task is well illustrated by the fact that 996 U-boats were destroyed, an average of 1 every second day throughout the war. Of these U-boats one-third were destroyed within 500 m. of the U.K. See F. Taprell-Dorling ('Taffrail'), *Western Mediterranean*, 1942-5, 1947; G. Stitt, *Under Cunningham's Command*, 1944; Adm. Sir W. M. James, *The British Navies in the Second World War*, 1946; R. Grenfell, *The 'Bismarck' Episode*, 1948; S. E. Morison, *The Battle of the Atlantic*, 1939-43, 1948; A. Martienssen, *Hilber and his Admirals*, 1948; R. Langmaid, *The Med.: the Royal Navy in the Mediterranean*, 1939-45, 1948; J. Cowie, *Mines, Minelayers, and Mine-laying*, 1949; J. C. Crosswell, *Sea Warfare*, 1939-45, 1949; C. D. Bekker, *Swastika at Sea*, 1953. For U.S. naval hist. see S. E. Morison, *History of U.S. Naval Operations in World War II*, 1942, seq. still (1957) in course of pub.

**Naval Reserves.** In addition to all officers of the R.N. on retired pay, who are automatically on the reserve and liable to be called up in emergency, the navy maintains the following reserves: (1) Royal Fleet Reserve (R.F.R.), open to men with a minimum of 3 years' service in the R.N. or Royal Marines. It carries a retaining pay of 1s. to 1s. 6d. a day according to rating and demands 7 days' continuous training every 2 years. (2) Royal Naval Reserve (R.N.R.), which was reorganised in 1958 and now incorporates the old Royal Naval Volunteer Reserve (R.N.V.R.) and the Royal Naval Volunteer (Wireless) Reserve (R.N.V.(W).R.). The new R.N.R. is drawn from officers of the Merchant Navy, men of the Fishing Fleet, and those in civilian occupations ashore. The Reserve have 11 divs.: London, Ulster, Sussex, Tay, Tyne, Severn, Clyde, Forth, Solent, Mersey, and S. Wales. (3) Royal Naval Volunteer Supplementary Reserve (R.N.V.S.R.) comprises ex-temporary naval officers willing to serve in an emergency. No training is required. (4) Royal Naval Emergency Reserve (R.N.E.R.), estab. in 1949 for ex-naval ratings willing to serve in an emergency. No training is demanded. (5) Royal Marine Forces Volunteer Reserve (R.M.F.V.R.) is the first auxiliary reserve of the Royal Marines, and maintains units in London, Glasgow, Birkenhead, Bristol, and S. Shields, with detachments in certain other places. This reserve is run on the same lines as the R.N.R. (6) Royal Marine Emergency Reserve (R.M.E.R.), a reserve of ex-Royal Marine officers and men willing to serve in an emergency. No training is demanded. (7) Women's Royal Naval Reserve (W.R.N.R.), which provides women with an opportunity of part-time and ann. naval training. The W.R.N.R. works in close co-operation with the R.N.R. and has units attached to each of its divs. (see R.N.R. above). (8) Women's Royal Naval Supplementary Reserve (W.R.N.S.R.) comprises a list of ex-W.R.N.S. officers and ratings, with a minimum of 1 year's service, willing to serve in an emergency. (9) Royal

Naval Special Reserve (R.N.S.R.), which consists of R.N. and Royal Marine national servicemen who are fulfilling their part-time national service commitments on completion of their full-time service.

**Naval Scientific Service, Royal,** comparatively new branch of the R.N. retained after the Second World War as a permanent service. During the First World War there were great developments in the application of science to warfare, and the Admiralty had to bring in scientists to co-operate in the development of wireless, mines, gunnery systems, and devices for all sorts of purposes. The lesson of all this was quickly appreciated and a decision taken to retain in being a number of the experimental organisations which had sprung up during that war, and a number of the scientists in these organisations were persuaded to stay on permanently. The Admiralty Research Laboratory was built at Teddington, and the staff scattered about in the various estab. were brought under a single grading system and organised in what were known as the Admiralty Scientific, Technical, and Chemical Pools. During the inter-war period the situation remained comparatively static. Personnel was slightly increased during and after the Abyssinian crisis of 1935, but it was not until 1939 that any substantial change took place. The Second World War being recognised as a scientist's war, the naval scientific organisation expanded correspondingly and the personnel increased tenfold over the 1935 level and even then could not cope with all its tasks adequately. The old permanent corps was reinforced by scientists of all kinds drawn from every source. The achievements of this force were great and may be exemplified in the speedy mastery of the magnetic mine, and in other services the nature of which may not yet be divulged. The net result was that the Board of Admiralty was impressed with the need to give more adequate recognition in its organisation to the scientific arm, and in Sept. 1944 it announced its intention to establish after the war the R. N. S. S. This was done in 1946 when the post of chief of the R. N. S. S. was created, with the oversight of 4 new depts, each under a scientist of the status of full director. Thus to-day the R. N. S. S. holds a very central and important part in the Admiralty organisation.

The scope of the work of the R. N. S. S. is of the widest, covering research and development of every kind in physics, chem., and engineering by way of promoting the fully up-to-date fighting efficiency of the navy. The greater part of the work of the R. N. S. S. is concerned with ships. In addition to ordinary seaworthiness naval vessels must be capable of withstanding altogether abnormal stresses and strains from attack by guns, torpedoes, and mines and bombs. The effects of blast and explosion, both on the surface of the sea and beneath, pose most difficult problems, in the solution of which

the scientist can help the constructor. Again, the requirements of warships' and submarines' engines are stringent as compared with those of the mercantile marine, and the problems correspondingly greater. There is also the problem of communications, offering the widest field for the telecommunications engineer in radio reception, transmission, and direction-finding. As a further example of the value of the work done by the R. N. S. S. may be mentioned the fact that the navy possessed the Asdic device for countering the submarine menace at the outbreak of the Second World War, and throughout the war the R. N. S. S. in co-operation with certain univs. and industrial laboratories, kept the lead in the field of thermionic tubes, a success which was a major contribution to winning the war. The practical work of the R. N. S. S. is applied to civil life in industry in many ways. Examples of this are the development of the spectrographic method of analysis, which has in many cases replaced the old chemical method, and the application of radar as a navigational aid to the mercantile marine.

In the R. N. S. S. there are 2 main officer divs., the first consisting of the scientific officer grades, the second the experimental officer grades. The normal qualification for the scientific officer is a first- or second-class honours degree and the entry rate of pay for officers without post-graduate experience is £605 a year. Following a satisfactory probationary period, a scientific officer may expect promotion to the senior scientific officer (S.S.O.) grade (£1135-£1345) and to the prin. scientific officer (P.S.O.) grade (£1375-£1950), which he should reach in the early forties. Satisfactory entrants may expect to reach the senior (S.P.S.O.) grade (£2000-£2300) before the end of their careers. There is an appreciable number of posts in the deputy chief (D.C.S.O.) grade (£2400-£2700) and at £3000 and a very limited number at still higher pay. Special provision is made for what are known as 'special merit' appointments in the S.P.S.O. grade and very exceptionally in the D.C.S.O. grade for outstanding individual workers without any administrative responsibility. The experimental officer class is open to individuals with minimum qualifications of intermediate degree or higher national certificate. It is in 3 grades and pay ranges from an entry rate (£365-£655) rising to £805. Apart from a few chief experimental officers, the top grade is the senior experimental officer (S.E.O.) with a pay range of £1285-£1530. See 'The Royal Naval Scientific Service,' by F. Brundrett, in *The Central*, No. 99, June 1949.

**Naval Treaty of London (1936),** see under LONDON, TREATIES OF (10).

**Navan,** see AN UAIMH.

**Navan Fort (Eamhain Macha),** 2 m. W. of Armagh, N. Ireland, a gigantic elliptical earthenwork. It was the seat of the ant. kings of Ulster.

**Navarino, Pylos, or Neocastro,** fortified seaport of Greece, on Navarino Bay, in the

prov. of Messenia, 56 m. SW. of Tripolis. To the N. are situated the ruins of the ant. Pylos. In the bay the English, French, and Russians united for the protection of Greece, and defeated the Turkish and Egyptian fleets (1827). See also PYLOS.

**Navarra, Sp. prov.** stretching from the Ebro (q.v.) to the Fr. frontier, consisting of that part of the old kingdom of Navarre (q.v.) which lay S. of the Pyrenees (q.v.). Spurs of the Pyrenees occupy the greater part of the N. and E., and here the rainfall is heavy and many of the valleys are fertile. There is a region of arid steppe in the SE., but cereals, oil, and wine are produced in the plain dists. watered by the Ebro and its tribs., the Ega and the Aragón (q.v.). In the NW. is the R. Bidassoa (q.v.). Iron, silver, lead, copper, and salt are found. The cap. is Pamplona (q.v.). Area 4056 sq. m.; pop. 386,400.

**Navarre (Sp. Navarra),** former kingdom in the W. Pyrenees, corresponding to the modern Sp. prov. of Navarra (q.v.), and to part of the Fr. dept. of Basses-Pyrénées (q.v.). Inhabited from early times by the *Vascones* (see BASQUES) it became subject to the Visigoths (see GOTHs) in the 5th cent., and to the Moors in the 8th cent. It remained, however, a centre of resistance to the invader under its native rulers, and it passed in 1285 to France by the marriage of Philip IV (q.v.) with Joanna of N. In 1328, on the death of Charles IV, the Fr. crown went to the Valois (see FRANCE, *History*) and the daughter of Louis X became queen of a separated kingdom of N. as Joanna II. In 1512 Ferdinand II of Aragón (q.v.) seized that part of N. which lay S. of the Pyrenees and joined it to the new Sp. kingdom. The portion lying N. of the Pyrenees was incorporated with France in 1589 by Henry IV (q.v.), who inherited the crown of N. through his mother, Jeanne d'Albret (q.v.). The Sp. Navarrese were allowed to retain many of their ant. municipal charters and constitutional privileges until the 19th cent. In that cent., as a result of the support they gave to the Carlists (q.v.), the central gov. abrogated their national assemblies (*Jueros*) and amalgamated their nationality with that of the rest of the Sp. kingdom. See P. Boissonnado, *Histoire de la réunion de la Navarre à la Castille*, 1893, and L. de Urabayen, *Geografía humana de Navarra* (Pamplona), 1929.

**Navarrete, Juan Fernandez** (1526-79), called El Mudo (being a deaf mute), Sp. painter, b. Logroño. It is supposed that he was a pupil of Titian at Venice. In 1568 he went to Madrid as salaried king's painter to Philip II, and painted in the Escorial the 3 pictures of 'The Nativity,' 'The Baptism of Christ,' and 'Abraham receiving the Three Angels.'

**Navarrete, Martín Fernandez de** (1765-1844), Sp. scholar and naval officer, b. Abalos. He entered the navy in 1780, and became a captain in 1796. From 1789 to 1792 he was appointed to collect documents relating to the hist. of the Sp. Navy; he was made director of the hydrographic dept in 1823, and senator and



director of the Madrid Academy of Hist. in 1837. His works include *Coleccion de los Viajes y Descubrimientos que hicieron por Mar los Españoles desde fines del Siglo XV*, 1825, *Disertacion sobre la Historia de la Nautica*, pub. 1848, and *Biblioteca Maritima Española*, 1851.

**Navarretia**, genus of ann. herbs, chiefly Amer. family, Polemoniaceae; *N. squarrosa* is the Skunkweed of W. America.

**Nave** (Lat. *navis*, a ship), body of a church, from the west door to the chancel steps, and including the side-aisles, if any. This comprised the part of the church used by the lay public.

**Navew, Naven, or Navet**, old names applied to sev. cruciferous plants, but chiefly identified with *Brassica napus*,

any port or place from which they might reach enemy ter. or the enemy armed forces, and not covered by valid cargo navicert . . . shall, until the contrary is estab., be deemed to have enemy destination.' The effect of these provisions was that neutral shippers or ship-owners who shipped unnavicerted cargo to or from European ports did so at their peril. They ran the risk of losing both cargo and ship. Also under the provision of the ship warrant scheme the offending owner was liable to lose not only the warrant in respect of the particular ship concerned but also in respect of any other vessel in his possession.

**Navicular Disease, or Groggy Lameness**, inflammation and ulceration of the N.



NAVARRA: ESTELLA

Rape, and *B. rapa*, Turnip, cultivated respectively for their oily seeds and fleshy roots.

**Navicert**, system of naval control of neutral trade in time of war. The N. system implied the examination in neutral ports of outgoing cargoes and the issue of certificates to these free of contraband which would facilitate their passage through the naval control. The originator of the N. was Mr Skinner, U.S. consul-general in London during the First World War, but the system adopted in that war in 1916, which was revived in the early part of the Second World War to reinforce the system of control ports from Kirkwall to Haifa, differed from that in operation for the rest of the Second World War. An order in council in 1940 provided that 'any vessel on her way to or from a port from which goods might reach or come from enemy ter. or the enemy armed forces, not being provided with a ship navicert valid for the voyage on which she is engaged, shall, until the contrary is estab., be deemed to be carrying contraband or goods of enemy origin or ownership, and shall be liable to seizure as prize'; and also 'all goods consigned to

or shuttle-bone of the horse, invariably occurring in the forefeet, and due sometimes to hereditary causes or to overwork on hard roads, but more commonly to driving at excessive speed after the horse has been kept for some time without exercise. The inflammation causes a constant irritation in the foot, which results in contraction of the frog and alteration in the shape of the horse's foot until it resembles that of a donkey. Special shoeing, preferably with an india-rubber bar pad, and short shoe, affords much relief and enables the animal to work tolerably well, but the disease is incurable. Lameness can be abolished by unnerving, i.e. an operation severing the nerve conveying the pain sensations from the hoof.

**Navigation**, name applied to the science of finding the position of a vessel at sea (or of an aircraft, as to which see AERIAL NAVIGATION) and so directing her from one point to another. During most of the first 15 cents. of the Christian era, sailors such as the Phoenicians, the Carthaginians, Greeks, and Romans depended entirely upon their observation of the skies and their proximity to the coast,

from which they seldom ventured out of sight. The Vikings probably did most of their navigating under similar conditions, and their discovery of Iceland, and possibly of America, was a result of their being blown out of sight of land and of their inability to direct themselves. During the Renaissance the science of N. became a more or less exact one. This was due very largely to the discoveries of the Portuguese sailors and more especially to the work of Prince Henry the Navigator. The cross staff, an invention by which long. could be determined, was first made by Werner about the beginning of the 16th cent., and, later, chronometrical observation in conjunction with the use of nautical instruments came into general use. Davis invented a back staff which seems to have been very generally accepted and this form of quadrant remained in use for a very long time. Much about the same time an instrument came into use for the determination of the height of the sun and stars (the astrolabe). The inventions and discoveries of Mercator did much to increase the accuracy of N. The inventions of Wright did much also in this direction, and finally towards the beginning of the 17th cent. arithmetic, trigonometry, and logarithms began to be used as methods of calculation. Probably the greatest work of this cent. was that of Martin Cortes, whose book was accepted as authoritative. The foundation of the Royal Observatory at Greenwich by Charles II in 1675 was the direct result of the need for a reliable method of determining the position of a ship at sea. In 1763 the *British Mariner's Guide* was pub. by Dr Maskelyne, and this was really the nucleus of the *Nautical Almanac*, which was first pub. in 1766 for the year 1767. Pub. has continued without interruption since that time. The author of the *British Mariner's Guide* had also, 2 years previous to this first pub., discovered a method by which long. might be determined by lunar observation.

**PRACTICAL NAVIGATION: Coastal.** In navigating a vessel along a coast the exact position is usually ascertained by reference to points of land, lighthouses, and beacons, in conjunction with a chart of the vicinity. When it is possible to refer to more than one point the position is easily ascertained, because a ship's position is where compass bearings, after correction for deviation, intersect on the chart. When only one point is available a bearing can be taken provided a sextant angle of the point or headland is also taken in daylight and the height of the point is shown on the chart. Another method adopted is to take a bearing of a point and then continue the vessel in the same course for some distance, at the end of which time another bearing is taken and these 2 bearings are marked down on the chart. By means of a parallel rule placed in the same direction as the ship's course, it is now possible to find and mark the exact position of the vessel when any current or leeway or both has been allowed for. Another variation of the foregoing methods of finding the position of the

vessel is known as the 'four-point bearing.' This is used when the ship is 'abeam' of the point of which observation is being made. A bearing is also taken when the point is 4 points on the bow. When it is possible to take observations of 2 points, these observations are taken simultaneously and marked on the chart; the point of intersection is the position of the vessel. With 3 points in view an instrument called a station pointer is used and the angles between them found by means of its 3 arms. These 3 arms are attached to a circle made of celluloid, and when the arms have been placed in such a position that they correspond with the angles between the points, it is placed on the chart, and the centre of the circle gives the exact position of the vessel. In coastal N. when the weather is foggy the ship is navigated by means of 'feeling' round the coast with the lead or sounding machine (see *Modern Ocean Navigation* below). Naturally this is the most unsatisfactory of all methods, and soundings have to be continually taken in order to get even an approximate position. When using this method it is necessary to know the state of the tide (see *TIDES*) and to reduce the soundings to low water, as all depths shown on a chart are given as low-water spring tides.

It is necessary to bear in mind that all bearings taken from the compass must be converted into magnetic bearings before being marked on the magnetic chart, and even if the chart is a 'true' one, variation must still be allowed for. A bearing may be best defined as an observation by compass of the direction in which a point lies from the vessel.

**Modern ocean navigation.** The increase both in the size and the speed of ships has led to many developments in the science of N. Problems formerly regarded as purely theoretical have within recent years become very practical, and the science of N. to-day is much more intricate and precise than it was some decades ago. A long ocean voyage is first mapped out as carefully as possible on a great circle chart, the shortest possible route being chosen. The track thus chosen is followed also on a chart which shows probable wind directions and currents, and is modified according to the information given therein. In addition the track chosen would be also modified by such information as navigator's books relating to that region would give, and by the information supplied by the Admiralty's *Ocean Passage Book*. Next the route would be transferred from a great circle chart to a Mercator's projection chart, on which the great circles are shown, for convenience' sake, as straight lines, whilst the 'rhumb' line (the representation of the N. of the ship) is shown as a curved line. All meridians and the equator are shown on Mercator's projection as straight lines. The great circles are *not* followed in the steering of the ship; each circle is divided into chords which are followed instead, since that means only the alteration of the course by one or two degrees at the end of each

chord, whereas to follow the great circle would involve the constant changing of the course. The general track to be followed having been laid down, there are 3 methods by which it is possible at any point to ascertain the position of the vessel. These are: (1) the recording of the track on charts, a difficult matter owing to the constant errors which creep in and which cannot well be avoided; (2) by trigonometrical calculation, which is based on the course steered and the distance run; (3) by astronomical observation. As long as the ship is in sight of land, those methods which have been described under the heading coastal N. are used. In rough or hazy weather continuous soundings are taken when in localities which are known to be dangerous, and it is necessary to remember that the soundings must be continuous, since an occasional sounding is more dangerous than useful. Lord Kelvin's sounding machine, which is still used for that purpose, consists essentially of a drum round which is coiled sev. thousand fathoms of fine wire, the free end carrying a specially designed sinker or lead (q.v.) which will enable a sample of the ocean bed to be brought to the surface. The wire passes over a registering wheel which indicates on a dial the length of wire run out. Two brakes are fitted to the large wire drum, one to control its rotation and the other automatically to stop the mechanism when the sinker reaches bottom. This amount of wire is available in a surveying ship, but the normal ship's outfit is only 300 fathoms.

A more modern method of ascertaining the depth of water is by echo-sounding. Broadly, this is done by producing a sound in the water near the surface and accurately measuring the short interval of time which elapses before the echo reflected from the bottom is heard. This system requires sensitive time-recording instruments, but has the advantage that sounding can be conducted in all weathers at any speed of the vessel. During these periods the coast chart is used, this being on a very much greater scale than the ocean chart, which is usually known as the small scale chart. Before losing sight of land the lat. and long. (q.v.) are calculated by means of the methods already described, and the exact position is transferred from the coast chart to the small scale chart. After this the position of the ship is calculated by the methods given under the heading (2) above. This method is rectified wherever possible by means of astronomical observation and by a calculation of the changes of lat. and long. by means of plane trigonometry, frequent use being made of the traverse tables. These methods of discovering the exact position of a ship are known as dead reckoning, and the modern ship's compass, patented by Lord Kelvin, has done much to ensure its accuracy. The distance run by the ship is obtained by the patent log, but it is not regarded as entirely accurate, the distance run by the ship being calculated more accurately by the number of revolutions of the

engines. The most accurate means of ascertaining the exact position of the ship, however, is by astronomical observation, and this is always employed wherever possible. Dead reckoning is only used during bad weather conditions. The astronomical observations are attended by many difficulties. The instrument



SPERRY GYRO-COMPASS

The gyroscope compass derives its north-seeking qualities from a combination of four natural laws, the first and second of which are properties of the gyroscope, the third gravitation, and the fourth the earth's rotation. These natural laws provide a source of directive force for a compass that indicates the true north and does so with a degree of steadiness comparable to that of an object on shore. In addition to indicating the true north, the Gyro-Compass is capable of operating, repeating, or indicating compasses wherever their indications may assist in navigating the vessel. (*Sperry Gyroscope Co. Ltd.*)

used for making these observations is a sextant (q.v.); but this, owing to the conditions under which it has to be employed, must give rise to some little error. Navigators attempt, and to a great extent succeed, in rectifying such error by taking the average result of a number of observations made at different times. One of the greatest marvels of modern N. is the reliance which can be placed upon N. by star observation. The most accurate of all observations is probably the twilight observation, when the brighter stars are

just visible and the horizon is visible also. For this purpose the armillary sphere is employed. This is a small celestial globe on which is marked all the prin. stars visible to the naked eye. By manipulating the sphere which is elevated, until sidereal time is under the fixed meridian, a correct representation of the heavens is thus obtained. Astronomical observations are made at sea for the purpose of ascertaining lat., long., error of the compass, and lat. and long. simultaneously. The chief heavenly bodies observed are the sun, moon, Venus, Mars, Jupiter, Saturn, and the Pole star, together with all stars of the first magnitude. The *Nautical Almanac* gives the position of all these for fixed times at Greenwich, and gives also all necessary information for computing the position of these bodies at all times in all places. An important development is the application of directional wireless telegraphy to N., being particularly useful in foggy weather for establishing the position of a ship approaching the land. The principle of operation of a direction finder depends upon the fact that the antenna, or aerial, of a wireless transmitting or receiving installation emits or absorbs radiations most strongly in its own plane. In the direction finder used in practice, the antenna consists of a flat coil of sev. turns of wire mounted on a vertical axis about which it is free to rotate so that its plane may be pointed in any direction of the compass. As a receiver it is turned until the signals are received at maximum strength, when it is known that the plane of the coil must point to the transmitting station. Direction-finding apparatus is either housed on land, when in response to a message from a vessel it can determine and signal to the ship its position, or carried on board and pointed towards a land station.

Another form is the rotating 'beacon.' This consists of a radio-transmitting station at some known point on land, having an antenna which is continuously rotated at constant speed and which is always automatically emitting a special Morse code signal. At a particular point in its rotation a characteristic signal is sent out. This system is declining in favour, although it has the advantage that no special wireless-receiving apparatus is required on the ship and the bearing can be taken on a broadcast receiver with the aid of a stop watch.

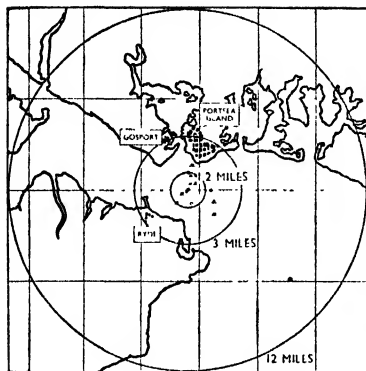
The gyroscopic compass has also been of great assistance to navigators. It has 3 important advantages: it is unaffected by magnetic effects of iron or steel in its vicinity; it always points to true or geographical north; and it is invaluable in high lat., where in a magnetic compass the card is straining to stand on its edge with consequent loss of efficiency. It is composed of a gyro-wheel rotated at high speed by electricity, and this, if free to do so, will always set itself so that its axis lies in the true north and south meridian. A compass card and auxiliary parts are mounted on gimbals. The actual gyro-compass is mounted in a special room in the ship, and repeaters synchronised with

it are erected where required in other parts of the vessel. The gyroscopic compass is regarded by many seamen as the greatest of all modern aids to N.

**Radar.** Radar (q.v.) is used for 3 main tasks in N.: (1) to provide warning of the approach of ships, icebergs, etc., and to avoid collisions; (2) to assist in the N. of coastal waters; (3) as an aid to the pilotage of restricted waters.

It is usual to provide scales of display so that the radar screen covers variously ranges up to 30 nautical m., 12 nautical m., 3 nautical m., and 1.2 nautical m. A set should provide a clear indication of coastlines at 20 nautical m. when the ground rises to at least 200 ft. and at 7 nautical m. when it rises to at least 20 ft. Ships should be seen at 7 nautical m., fishing vessels at 3 nautical m., and buoys at 2 nautical m. It has been found that by fitting buoys with corner reflectors the radar response can be increased to 8 or more nautical m. By means of a chart comparison unit the picture may be viewed in coincidence with a chart. Another method is to project a magnified image of a micro-film transparency of the chart on to the face of the plan position indicator (P.P.I.). Shore radar can be used for port and harbour supervision as it provides instantaneous information of movements in the port area. It is also of value in enabling the port authority to know whether buoys or light vessels have moved from their charted position in bad weather and, if so, to know their new position. The ports of Douglas (Isle of Man) and Liverpool are both fitted with radar and at the latter place the pilots carry portable radio telephones which enable the control staff on shore to communicate instructions and advice concerning the pilotage of the ship; this is of particular value in foggy weather or when unusual conditions exist. The Liverpool-Wallasey and Gravesend-Tilbury ferries are also assisted in bad visibility by shore radar in conjunction with a radio-telephone link. Experimental Ramark beacons have been estab. at St Catherine's, Isle of Wight, and Portland Bill light-houses. When the ship's radar aerial points towards these places a broken bright line appears from the centre of the radar screen to its circumference on the bearing of Ramark in relation to the ship. To enable the navigator to identify the Ramark, small dots are used for St Catherine's, large dashes for Portland Bill. The range of these beacons is 12-14 m.

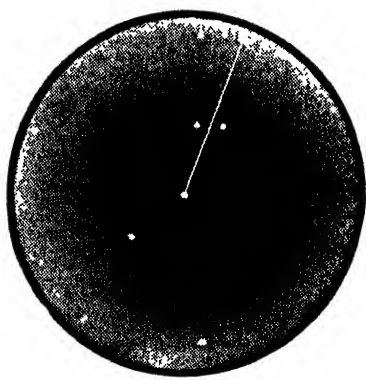
**Loran** (Long Range Navigational Air) employs pairs of pulse-transmitting stations spaced up to 600 m. apart. The pulses are received and displayed on a cathode ray indicator from which the operator can determine the difference in arrival time between the 2 pulses. The ship's position is determined by taking a path difference reading from 2 pairs of stations. The observations and plotting take about 5 min. and the range over the sea is approximately 700 m. by day and double this distance by night. This system was used extensively during the



## NAVIGATION BY MARINE RADAR

Simplified plan or chart of the Solent, the strait between the Isle of Wight and Hampshire, England, showing Itide pier and the surrounding coastlines. In this and the accompanying diagrams the ship's position is shown as a white circle in the centre of the plan or screen, and its direction is assumed to be north-east by north. The scale of display may be changed so that the screen covers 30, 12, 3, or 1.2 nautical miles. The last three are shown by the concentric circles on the plan.

The illuminated 12-mile display on the radar screen of the Solent equivalent to the whole of the simplified chart at the left, as it would appear on the screen at a scale of approximately  $\frac{1}{4}$  inch to 1 mile. With the ship in the centre, the surrounding coastline can be discerned as a recognisable pattern of light with its many indentations, harbour entrances, etc. On the port quarter an elongated pencil indicates Itide pier, and surrounding buoys appear as several points of light.



## DIAGRAMS OF PLAN POSITION INDICATOR (P.P.I.)

In this second diagram the range switch has been turned to the 3-mile position and the display thus brought up to the correspondingly larger scale of 1 inch to 1 mile. Surrounding objects are defined with greater clarity and detail. Reference to the circular range scales superimposed on the chart of the Solent shows the area which is embraced by the 3-mile range in relation to the above diagram.

The 1.2-mile position above gives an even greater expansion to the scale of the display, now covering the area within the smallest circle on the chart, the scale being 3 inches to 1 mile. Buoys are displayed with great accuracy. The thin bright line (thickened for the purpose of this reproduction) is the luminescent ship's leading line, brought on the screen by a switch.

*Cossor Marine Radar*

Second World War and the whole of the N. Atlantic and the Pacific was covered by Loran.

Gee is similar to Loran and consists of a master and 2 or 3 shore stations sited up to 80 m. apart and emitting continuous series of synchronised radio pulses from omni-directional aerials. The range over the sea is 100-50 m. The equipment is comparatively simple to operate and a navigator can plot his position in a minute.

Decca, like Loran and Gee, employs the 'hyperbolic' system. A number of transmitting beacon stations have been erected in Great Britain and on the Continent and, by means of special receiving equipment in a ship and special navigational charts on which are superimposed a lattice of lines of position, the ship's exact position can be ascertained. The range is approximately 300 m. and this system is practically confined to ships employed in the home and coasting trades (see also AERIAL NAVIGATION).

See S. T. S. Lecky, *Wrinkles in Practical Navigation*, 1890; F. C. Stebbing, *Navigation and Nautical Astronomy*, 1903; W. Hall, *Modern Navigation*, 1909; Ministry of Transport (H.M.S.O.), *Radar and Radio Position Fixing Systems for Marine Navigation*, 1946; E. M. Robb, *Application of Radar to Seamanship and Marine Navigation*, 1949; P. Collinder, *History of Marine Navigation*, 1954; G. T. Sonnenberg, *Radar and Electronic Navigation*, 1955; E. G. Taylor, *The Haven-finding Art: a History of Navigation from Odysseus to Captain Cook*, 1956. See also GREAT CIRCLE SAILING.

**Navigation Acts**, long series of Acts of a protective nature passed from time to time to prevent foreign competition on equal terms with Eng. ships. Although these Acts date back to the time of Richard II, the chief Act was that passed under Cromwell in 1651, directed principally against the Dutch. It provided that imports should be brought into England only in Eng. vessels or in vessels of the country producing the goods, and Eng. exports carried only in Eng. ships. The object was to monopolise as far as possible the carrying trade of the world. This restriction also applied to any Eng. dependencies. To a very great extent these laws accounted for much of the trouble between Great Britain and Ireland, and also between the Amer. colonies and the mother country. These restrictions on foreign trade were not totally withdrawn until the middle of the 19th cent., and even in the withdrawal the right was retained to retaliate if restrictions were placed on Brit. N. in foreign waters.

Naville, François Marie Louis (1784-1846), Swiss philosopher, b. Geneva. He was pastor at Chancy in 1811, and founded there, and later at Vernier, a model school. He followed the philosophy of Maine de Biran. He pub. *De l'éducation publique considérée dans ses rapports avec le développement des facultés la marche progressive de la civilisation, et les besoins de la France*, 1832, *La Charité légale*, 1836.

Navsari, tn of Bombay state, India, 145 m. north of Bombay. N. has for long been the main centre of the Parsees in India, and it is here that their priests receive their instruction.

**Navy, Department of the**, gov. dept of the U.S.A. (The term 'Navy Department' is often used synonymously, but strictly speaking it refers only to the H.Q. estab. at Washington.) It is administered by the secretary of the navy, not of cabinet rank since 1947, when the dept was placed under the National Military Estab. The secretary's prin. civilian assistants are the under secretary of the navy, the assistant secretary of the navy, the assistant secretary of the navy for air, and the judge advocate general. The prin. naval adviser is the chief of naval operations, who is also the naval member of the joint chiefs of staff. The dept is administered on a bureau system introduced in 1842; these bureaus are: naval personnel, ordnance, ships, aeronautics, yards and docks, supplies and accounts, and medicine and surgery. See also UNITED STATES NAVY.

**Navy, U.S.A.**, see UNITED STATES NAVY and NAVY, DEPARTMENT OF THE.

**Navy and Navies.** The general policing of the high seas has for a long time been one of the prin. duties of the Brit. N. To this end the English have in hist. maintained their supremacy of the sea, which in early times was a vital necessity when the is. was open to the invasions of the Vikings. The incursions of the Vikings made it necessary to provide some force by means of which the English could stop the constant menace of invasion from the E. Alfred the Great fought the Danes on their own element, and in order to do so made a levy on each of the sea-border cos. for the provision of a certain number of ships, or a certain amount of money or men for the upkeep of those ships, to defend the coasts of the country. Between Alfred's time and the Norman Conquest the 'levied' N. was supplemented by the possession by the king of royal ships, and during the years which followed the Norman Conquest the principles of feudalism were applied to the levying of a naval defence. The seaport tns held their charters and privileges in return for men and ships which were to serve the king for 15 days in the year at the expense of the tns. During the 12th and 13th cents. the fleet of the Cinque Ports was practically the national fleet, but this rapidly sank into disrepute, and the real R.N. came to be not the feudal array, but the mercenary N. In this respect may be compared the national N. and army, since both have come down from the purely mercenary forces which formed part of the conqueror's supposedly feudal invasion army, and which, especially under the later Plantagenets, displaced the feudal array. The main nucleus of the R.N., however, was the king's own ships, which were controlled by royal officials, and were entirely at the command of the king. The crusade of 1190 had one result at least, that of bringing into use in the Eng. N. the title of admiral, although it was not at first used in the

supreme sense in which it is used to-day, and indeed an admiral in that sense was not appointed until 1360, and a First Sea Lord, as the title is known to-day, was not appointed until well into the 15th cent. Even during the reign of weak Eng. kings the sovereignty of the seas was retained. In John's reign there were victories over Philip Augustus, and in Edward III's the victory at Sluys in 1340, and later over the Spaniards at Winchelsea in 1350. Up to this time, at any rate, the English had suffered no great defeat, and their claim to sovereignty in the narrow seas could not easily be disputed, as their retention of Calais for so long a period does much to prove.

During the Hundred Years War the English seldom found difficulty in invading France, and that perhaps was the supreme test. The N. led a somewhat chequered career during the period 1399-1485, but though it fluctuated in strength according to the strength or weakness of the reigning king it still remained in existence. During the Tudor period the N. increased in strength. Henry VII added to its numbers, not very greatly it is true, but nevertheless he laid the foundations for the greater N. which his son was to build. He also employed many of the royal ships on merchant ventures. Henry VIII took a deep interest in the N. He spent at least some proportion of the plunder of the monasteries in raising an efficient fleet, built according to the latest ideas. As far as the fleet is concerned, the Tudor period was a period of transition, but even during the reign of Elizabeth I it never became larger than it was during the reign of Henry VIII. Henry was also responsible for the estab. of a N. Board, under the direction of a Lord High Admiral, and this administrative reform remained in existence down to the time of William IV. The early hist. of the personnel of the fleet shows us that it was regarded very much more as a 'military' force than as anything else. The sailors who navigated the ship were not held of the same importance as the soldiers who defended it. They were also very much in the minority. By the time of Henry VIII this had to a very great extent changed, nor was this surprising. The era of discoveries had given the ships a very much wider scope than they had previously had. It was necessary now to have a majority of men who were capable of sailing and navigating the vessel. The fighting force, therefore, diminished very greatly in numbers. Further, the great strides which had been made in the science of navigation rendered it necessary that the men in command should be trained men, and not merely the favoured nominees of the king. It was fortunate that the same modernisation did not take place in Spain, so that the Armada battle was a conflict between the old and the new ideas of ships and sea warfare. Further, during the Tudor period the size of the ships increased, and although the number of ships in the N. of Elizabeth was less than in that of Henry VIII, nevertheless the actual tonnage was greater.

The Stuart period is of vast importance for the development of the N. During the reign of James I many great improvements were made. The position of Lord High Admiral was put into commission. Although the N. was not maintained at a very great strength, these commissioners nevertheless took steps to see that the fleet was efficient. Moreover the king himself took great interest in the development of the N., and especially in naval construction. This work was continued during the reign of Charles I, and many reforms were made in the matter of the personnel of the fleet, which was increased, and which received very much better wages. The ships that were constructed were of good quality, and it should be remembered here that Charles's first levy of ship money was in fact employed for the construction and increase of the N. The N. was, however, still small. At the outbreak of war the king had only about 40 ships, and these were handed over to Parliament by the newly created Lord High Admiral. During the period 1642-60 the N. passed into the hands of Parliament, and was controlled by admirals appointed by it. The N. did much good work, and under Cromwell it revived the days when it claimed the sovereignty of the seas. By 1660 the N. had more than trebled in size, and had nearly trebled in tonnage. Further, the naval service was no longer regarded as of necessity a service by pressed men; the admiral of the Commonwealth, realising the error of this, opened the service to voluntary servants as well as pressed crews. In view of the ever-increasing trade of England, and the necessity to protect the merchant service, the increase of the N. was essential to the well-being of the nation. During the reign of Charles II the N. did at last become truly national. The work of Samuel Pepys was of vast importance: as clerk of the Acts, and later as secretary to the Lord High Admiral, he spent his life in a constant and successful endeavour to put the administration of the N. upon a sound, ordered, and disciplined footing, and to provide ships and men for war and peace. The later hist. of the N. is a continuation of the rules which he laid down. Officers received a proper training from the time that they were boys, and special corps were founded in order to have an ever-increasing number of officers prepared for the service. The commerce of the country was much more amply protected, and piracy was put down with a strong hand. Up to the passing of the Test Act (1673) the Lord High Admiral was James, Duke of York (afterwards James II), who proved to be both interested and capable. The N. consisted of about 170 ships of over 100,000 tons, a personnel of 42,000 men, and nearly 7000 guns, a vast improvement on the previous reign.

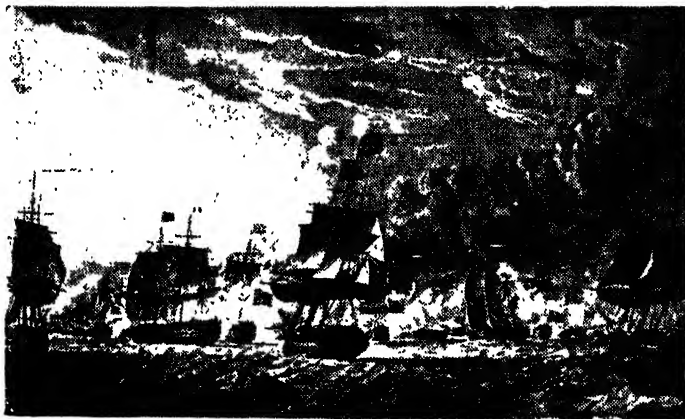
When the revolution came in 1688 the control of the N. passed almost entirely into the hands of Parliament. The title of R.N. was still maintained, and occasionally the form of appointing a Lord High Admiral was gone through, but as a

purely royal force the N. ceased to exist. The N. was controlled by the Navy Discipline Act of 1660, which was, at the end of the war of the Austrian Succession, supplemented by an Act of George II's reign. In 1793, when war broke out with the Fr. rep., decisive command of the seas was not yet estab., though the N.'s line-of-battle strength numbered 85 ships, with a section of which Howe defeated a Fr. fleet off Ushant on 'the Glorious First of June,' 1794.

Few great changes took place in naval construction until the reign of Queen Victoria. Many experiments were made, and the ships increased in size and in the

turrets carried an armour-plating of from 10 to 14 in. thick. The turret ships were in the course of time replaced by ships of the cruiser type. These were armoured and protected, and were speedier than the ordinary line-of-battle ships, but did not carry so much armour-plating and thus were not so well protected.

After 1880 Great Britain began a definite programme of naval construction calculated on a 2-power standard, i.e. up to the equality of the next 2 strongest powers in the world, which at that time meant Europe. From this programme developed the race in naval armaments which was a feature leading to the First



'THE GLORIOUS FIRST OF JUNE': LORD HOWE'S VICTORY, 1794

An aquatint after R. Dodd, reproduced by permission of the Parker Gallery, 2 Albemarle Street, London, W.1.

number of guns which they carried; but it was not until the beginning of the 19th cent. that the basic form of wooden ships with sails was changed. The first steam warship was constructed in 1814. After 1854 ships began to be armoured-plated, a tribute paid to the ever-increasing power of shells. The year 1860 saw the launching of the first ironclad of Great Britain, but this had been preceded by a vessel of like build launched by France in the previous year. Guns were, however, quickly invented which could pierce the armour carried by these vessels, and so later ships had a greater thickness of armour, and carried guns which were powerful enough to pierce the armour of the opposing vessels. The ordinary ironclad was about the year 1862 superseded by the turret ship, and under the direction of Sir E. T. Reed, the constructor of the N., a ship was produced which was capable of firing in all directions from central batteries, and did not depend entirely upon its broadsides. Turret and mastless warships were now regarded as the latest thing in naval construction, and the

World War, but it was the other nations who set the pace, because in their building programmes lay the threat to the Brit. Empire. From it evolved the super-dreadnoughts, ships of 20,000 tons upwards, with a maximum speed of 25 knots, carrying up to 9 16-in. guns, and a formidable secondary armament, with armour plating of 14-in. thickness or more. In the First World War the Brit. N. played a dominant part, preserving the country from invasion, keeping open the lines of sea communication, blockading the enemy, and making possible supplies and reinforcements to enable the final decision to be reached on land. As an indication of this vital part played by the Brit. Grand Fleet Churchill spoke of Adm. Sir John Jellicoe, its commander-in-chief, as the only man on either side who could lose the war in an afternoon. The casualties sustained by the Brit. N. during this war were 254 warships of all types lost as against 937 total enemy warships destroyed, and 39,766 officers and men of whom over 33,000 were killed, while the N. expanded from 2,419,043 tons



in Aug. 1914 to 4,087,950 tons in Oct. 1918.

After the war Great Britain announced that she had adopted a 1-power standard in view of the building programmes in Japan and the U.S.A., and proceeded to lay down 4 new battleships of 48,000 tons each. Such was the state of affairs when President Harding invited nations to the Washington Conference, which attained a measure of success by eliminating the factor of competition in naval armaments from the field of international relationships. Limitations imposed on the size of battleships (35,000 tons) now produced novel designs of which the *Nelson* and *Rodney*, of 33,500 tons, with their main armament of 9 16-in. guns all forward, were the most unusual. Meanwhile the possibilities of air power were being appreciated, and it was argued that the day of the capital ship was over, but the building by Germany, limited by the Versailles Treaty (q.v.), of 3 10,000-ton pocket battleships of the *Deutschland* class revived interest in this type of ship. These Ger. ships mounted 6 11-in. guns, 8 5.9-in., and 5 3.4-in. anti-aircraft, and were designed for a speed of 26 knots. Electric welding was employed in their construction, and internal combustion machinery adopted for propulsive purposes. France replied with the *Dunkerque*, 26,500 tons, 29 knots, 8 13-in. guns, 16 5.2-in. guns, which was built during the negotiations for the London Naval Treaty, 1930 (q.v.), held to extend the provisions made at Washington. As a result of this treaty Great Britain, U.S.A., and Japan scaled down capital ship strength, agreed to a 6 year building holiday, and put further limitations on cruiser design. France, incensed at Italy's insistence on naval parity with her, refused to approve these limitations, and began to build *contre-torpilleurs* of 2569 tons, while the Italians produced their *condottieri*, which were small cruisers of over 40 knots speed. Meanwhile Brit. cruiser strength was steadily reduced, while that of all other maritime nations increased. A striking indication of the way in which Great Britain had reduced her naval power compared with that of other countries was given by the First Lord in Nov. 1933, when he stated that, since 1914, the U.S.A. had increased her naval personnel by 39,700 and Japan by 40,000, whereas Great Britain had reduced hers by 55,000. In 1931 Japan gave notice of termination of the Washington Treaty, claimed the right of equality, and, now independent of the League of Nations, began pursuing a virile course of her own in naval construction. In the U.S.A. a programme of new construction up to the limits permitted by the treaty, together with a general modernisation of her ships, was going forward, France was about to launch her first post-war battleship, Germany was asserting her old independence, and any numerical superiority possessed by Great Britain lay in semi-obsolete and obsolete ships. Such were the conditions when Great Britain negotiated a naval treaty with Germany (q.v.) on 18 June

1934, when it was agreed that the latter country could build a surface fleet up to 35 per cent of Brit. naval tonnage, and possess a submarine tonnage of equal strength. She was, however, prepared to adhere to Article IV of the London Treaty which forbade the torpedoing of merchant ships on sight. Fr. opinion was incensed at this agreement, regarding it as a blow to the unity announced at Stresa (q.v.), and it hardened the determination to have nothing to do with Washington ratios. Within a few months Mussolini awoke Great Britain from her dream of disarmament by his campaign in Ethiopia, which brought a concentration of Brit. naval strength in Alexandria. The answer to the question whether sea power was still effective before the air might of another nation seemed imminent. But hostilities were avoided, though events demonstrated the necessity for Britain to uphold her old position at sea.

During this crisis the second London Naval Conference opened in Dec. 1935 (see LONDON, TREATIES OF (10)), as the powers had agreed to meet within a year of the termination of the Washington Treaty by one of them. Japan withdrew, while France and Italy were unable to associate themselves with the agreement reached between Great Britain, the dominions, and the U.S.A. This limited capital ship armament to 14-in. guns, reduced the size of aircraft carriers, and imposed still further limits on cruiser construction. But the growth of international tension soon made the treaty abortive, and advantage was taken of the 'escape' clauses to meet the war which threatened. Could the N. still defend the vital interests of the empire in view of the new air menace? Had it the right type of ships? Were they properly armed? Were its functions adequately co-ordinated with those of the other services? And had the development of asdics reduced the threat from submarines which had nearly brought defeat in the First World War? All these questions were now to be answered, and lessons were to be learnt at great cost. It was soon apparent that, although a warship well manoeuvred was a more difficult target for an aircraft to hit with a bomb than had been expected, the ships themselves were woefully deficient in anti-aircraft guns. In many destroyers the torpedo tubes were removed, and combined low/high angle guns substituted as they became available; cruisers, such as the *Dido* class, were solely armed with these dual purpose guns, which also formed the secondary armament of the new battleships of the *King George V* class (see further 'KING GEORGE V'), and gradually numerous light, close-range anti-aircraft guns were mounted on their decks. Thus a few warships in company could eventually put up a heavy anti-aircraft barrage that both deterred and destroyed enemy aircraft. It was nevertheless clear that no warship, however armed, could operate with impunity within range of shore-based aircraft without the protection of some sort of air umbrella, and that insufficient attention

had been paid to sea/air co-operation. In 1939 the Fleet Air Arm had been regarded as little more than a long-range telescope for the fleet, useful perhaps to hinder an escaping fleet, and it had been accepted that carrier-borne aircraft must inevitably be slower and less powerful than their land-based equivalent.

However, from operations off Norway, in the Atlantic against the *Bismarck*, in the Mediterranean and in the Pacific (see NAVAL OPERATIONS IN SECOND WORLD WAR), emerged the modern conception of the Naval Air Arm, with its carriers providing the main 'hitting' power of the fleet (see AIRCRAFT CARRIER). The war indeed proved that naval aircraft could even win a sea battle before the guns on either side had fired a shot (see NAVAL OPERATIONS IN SECOND WORLD WAR, *Battle of Midway Island*). The elements of the air arm are now integrated with the fleet and comprise between one-quarter and one-third of the total strength of the N. The aircraft carrier has thus superseded the battleship as the most important fleet unit, although battleships in the Second World War, when operated properly, justified their existence and confounded the inter-war critics who prophesied their doom (see BATTLESHIPS). Protecting convoys against powerful surface raiders, hurling hundreds of tons of high explosive into enemy positions ashore in N. Africa, Italy, and Normandy, and protecting carriers themselves from both surface and air attack, they fulfilled their purpose in modern warfare. There were also occasions when weather conditions prevented the operation of aircraft, such as when a Brit. battleship, the *Duke of York*, destroyed the powerful Ger. battleship *Scharnhorst*, which menaced the convoys to Russia. Against submarines the early confidence in asdics was at first misplaced. The apparatus could certainly detect submerged U-boats in general conditions, but it was not designed to seek out the enemy on the surface at night. Thus U-boats were often enabled to approach on the surface without detection and attack convoys in darkness, causing heavy losses. These attacks could only be overcome by more escort vessels and, in due course, the corvette and frigate were developed. Not differing greatly from sloops, they possessed advantages in respect of handiness and economy of personnel, and, most important of all, could be built quickly and in numbers. They carried depth charges and H.A./L.A. guns. But it was not until the development of radar that the measure of the submarine menace could be taken, when they were once more subject to detection, whether on the surface or submerged. In countering the U-boat the N. developed a close association with Coastal Command (q.v.) of the R.A.F., while escort carriers sailed with nearly every convoy. These were merchantmen converted by the U.S.A. under lend-lease and returned at the end of the war. Towards the end of the war Germany had developed a device where, by fitting U-boats with a *Schnorkel* (or breathing

device), they could remain submerged for extended periods, and could thus escape both aircraft and the radar screen. Fortunately the war ended before this invention could influence the battle of the Atlantic to any great extent. In spite of the great battle against U-boats, however, and the developments in the mine and torpedo, it is a fact that these weapons did not influence the tactics of warships to the same extent as they did in the First World War.

In general it can be said that the N.s of Great Britain and the U.S.A. achieved their strategic objectives (see STRATEGY). They maintained the flow of shipping across the oceans, without which the strongest armies and air forces would have been powerless to act; they denied to the enemy his ability to use the sea, and imposed an effective blockade on his coasts; they successfully transported powerful armies across thousands of miles of ocean with barely a loss, making possible the campaigns in Africa and Europe; they guarded the flow of oil to feed the growing air forces; and, with the N. of the U.S.A. as the major partner in the area, carried the war across the Pacific to the threshold of Japan. Meeting the threat from the air they challenged it by making the aerial weapons their allies, changing their tactics without fundamentally altering their strategy. But at a cost. The losses to the Brit. N. (including dominion N.s and Royal Marines) were more than two-thirds greater than they were during the First World War: over 73,000 officers and men lost their lives, 1500 Brit. warships of all kinds were lost; but although over 2000 merchant ships were sunk in the N. Atlantic alone, this figure represented less than 2 per cent of the numbers conveyed. On the other hand, the axis powers lost 996 submarines (German 781) against the Brit. losses of 76, and almost 1700 other war vessels (including 627 in the Pacific destroyed mainly by the U.S.A.). Meanwhile, in spite of its losses, the Brit. N. expanded from 423 effective fighting vessels of all kinds in 1939 to 2040 in 1945, without including hundreds of landing craft and motor launches; and its personnel increased from 133,000 to 864,000. On the conclusion of war these figures rapidly decreased: warships were scrapped, sold, or transferred to dominion N.s, others placed in reserve, 4500 merchant craft employed on naval service were dispersed, over 1200 fishing vessels released, and by April 1957 the personnel reduced to 121,500. The rapid post-war reduction in personnel caused such a lack of balance from the loss of experienced men that in 1947-8 it was necessary to immobilise the greater part of the fleet. But the build-up to peace-time strength proceeded slowly, and the Brit. fleet, including vessels in reserve, stood in April 1958 at 1 battleship (reserve), 9 aircraft carriers (5 in reserve), 15 cruisers (8 in reserve), 1 guided weapon trials ship, 56 destroyers (30 in reserve), 105 frigates (54 in reserve), 57 submarines (18 in reserve), and 208 mine-sweepers (156 in reserve). One carrier, 3 cruisers, 14

frigates, 5 submarines, 25 mine-sweepers, and 7 coastal craft were under construction in 1958, and development work had started on a nuclear-powered submarine.

Since the Second World War the Brit. N. has resumed its peace-time functions of showing the flag as well as carrying out duties in connection with the occupation of ex-enemy countries. It has quelled disturbances in Aden, Mogadiscio, and the Solomons, and restored stability in many another troubled area; it has played an active part in coastal operations against Communist bandits in Malaya, in the

the Brit. N. has not worked alone, but in co-operation with other nations of W. Union and the N. Atlantic Treaty. For the first time in hist., during a period of peace, an international fleet assembled in Brit. waters in the summer of 1949, when warships of countries belonging to W. Union carried out combined manoeuvres and exercises under the command of a Brit. commander-in-chief. Recognising the vital importance of inter-service co-operation, much attention is also paid to the training of officers and men in the technique of combined operations, and in



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THE FRIGATE, H.M.S. 'MURRAY'

Korean War, and in the Anglo-Fr. action in Egypt in 1956; brought succour to distressed areas; swept the sea of thousands of mines laid during the war; continued to chart inadequately surveyed coasts; and carried out investigations in the polar regions. (For the *Amethyst* incident see YANGTSEKIANG.) But its prin. function has not been neglected: the preservation of sea communications in time of war. Changed conditions produced by the growth of air power, the nuclear bomb, the development of high-speed submerged submarines, the extension of radar, have in no way altered this conception of the N.'s function, though they have demanded a different and more scientific approach to it. This has been recognised in the growth of the Naval Scientific Service (q.v.), and in the encouragement given to research. In constantly exercising to test new tactics

the joint naval/air anti-submarine school the problems of anti-submarine warfare are being investigated on a 2-service basis. To-day, owing to the technical developments and the growth of naval aviation, a greater part of the N. is quartered ashore than ever before. Conditions have improved. The number of married quarters for naval personnel serving in shore estabs. has been greatly increased; more attention has been paid in ships themselves to better messing accommodation and ventilation; pay has been increased, and more opportunities given to ratings who prove themselves worthy to rise in the service (see NAVAL EDUCATION and RANK). The maximum 1958 figure of 112,000 for the N. is to include 10,040 Royal Marines (q.v.), who in addition to their traditional functions now provide and train the permanent peace-time amphibious commando units, and 8370

W.R.N.S. (q.v.). The reserves (see NAVAL RESERVES) could probably provide another 100,000 at short notice in an emergency.

On the future of N.s there is considerable speculation. They have grown up in the past in a world composed of sovereign states, many of which had a common standard of material strength. But the Second World War left the world with only 3 great powers that counted: the U.K., the U.S.A., and the U.S.S.R. The first 2 powers have so many ideals in common that war between them is unthinkable, and the U.K. naturally makes no attempt to engage with her transatlantic partner in naval competition. Indeed, in the event of hostilities, the 2 fleets would probably be integrated under the N. Atlantic Treaty. Also to be borne in mind is the greatly increased naval strength of Commonwealth countries such as Australia, Canada, and India. Russia is essentially a land power, but now developing her N., especially submarines. It is argued that the nuclear bomb has destroyed the effectiveness of fleets, but, on the other hand, it has been pointed out that this weapon is unlikely to be used against ships at sea where, by spacing them at greater distances apart, the damage can be so reduced as to make its employment uneconomical. The nuclear bomb has, however, modified the methods of sea warfare without altering its conception. Large fleets concentrated in harbours, as they were in the First World War, face annihilation, but by dispersing ships in many different bases when in harbour this menace can be minimised. It can also be countered by the development of the 'fleet train,' composed of auxiliaries of all kinds, used in the Pacific to supply and maintain ships at sea for periods of months if necessary. It may be that command of the sea as previously understood will, in future, be confined only to specified strategic areas. But the fact remains that, apart from internal disruption, only the denial to the U.K. of its ability to move its ships across the sea can cause its defeat in war. It is appreciated, however, that air power has robbed the N. of its ability to shelter the U.K. against attack, and allow the country time, in the event of war, to gather its strength in comparative tranquillity. It may also be that the design and material of warships will be modified. Aircraft carriers may eventually become obsolete as aircraft may in time be replaced by guided missiles. Ships approximately similar to the carriers and destroyers of to-day will be armed with guided missiles and will carry helicopters for reconnaissance and anti-submarine operations. It would appear that the submarine, nuclear-driven and armed with guided missiles, has tremendous possibilities as a weapon of war. Finally, the only effective answer to the nuclear bomb, or any other form of attack, is the direct human control of the enemy stronghold, which must require the use of all arms in unison and collaboration. This process must involve the movement by

sea of large armies and their equipment perhaps half way across the world. So long as such transport, involving command of the sea, is indispensable to the operation of armies, N.s can never be obsolete. See also NAVAL OPERATIONS; NAVIGATION; SEA POWER; and UNITED STATES NAVY; and the section *Defence* in articles on countries.

See A. T. Mahan, *Influence of Sea Power upon History, 1660-1783*, 1890, *Influence of Sea Power upon the French Revolution and Empire*, 1892, and *Naval Administration and Warfare*, 1908; J. A. Froude, *English Seamen of the 16th Century*, 1895; Ford, *Earliest English Navigation and the First Schools of Warfare*, 1906; J. R. Tanner (ed.), *Pepys's Memoirs of the Royal Navy, 1679-88*, 1906; Adm Sir H. Richmond, *The Navy in the War of 1739-48*, 1926, *Naval Warfare, 1930, The Economy of Naval Security*, 1931, *Sea Power in the Modern World, 1934*, and *The Navy*, 1938; H. W. Wilson, 'The Struggle for the Mediterranean' (*Cambridge Modern History*, vol. viii), and 'The Armed Neutrality and the Command of the Sea' (*Cambridge Modern History*, vol. ix); A. Hurd, *The Merchant Navy, 1921-4*; T. G. Frothington, *The Naval History of the World War, 1924*; Adm. Sir W. M. James, *The British Navies in the Second World War, 1946*; G. Holman, *The King's Cruisers*, 1947; A. Bryant, *Pepys* (3 vols.), 1947-9; M. Lewis, *The Navy of Britain, 1948*; A. R. Lewis, *Naval Power and Trade in the Mediterranean, AD 500-1100*, 1951; Sir. G. Callendar and F. H. Hinsley, *The Naval Side of British History, 1485-1945*, 1953; C. Lloyd, *The Nation and the Navy, 1954*; S. W. Roskill, *The War at Sea (H.M.S.O.)*, vol. i, 1954, vol. ii, 1957; M. Lewis, *The History of the British Navy (Penguins)*, 1957; *Jane's Fighting Ships*, pub. annually.

**Navy Board**, The, board estab. in the reign of Henry VIII to superintend the administrative work of the navy. It remained in existence between the years 1546 and 1832, when it was abolished and its work taken over by the lords of the Admiralty.

**Navy League**, The, organisation founded in 1895 for the purpose of advocating the building of an adequate navy for the protection of Great Britain and the maintenance of sea-power. It is on the strictest of non-party lines, and aims at the educating of Parliament and the people on the lines laid down in its programme. It propagates information concerning the navy, past and present, by means of monthly, quarterly, and ann. pubs., by lectures, and by the pub. of many pamphlets.

**Navy Yards**, see DOCKYARDS, GOVERNMENT.

**Nawanagar**, see JAMNAGAR.

**Naxos**: 1. Is. of Greece in the Aegean Sea, the largest of the Cyclades (q.v.), has an area of 170 sq. m. It is mountainous and fertile. In antiquity it was famous for wine and was a centre of the worship of Bacchus. It was here he met and married Ariadne. It was colonised by the Athenians, conquered by Persia in

540 BC, and recovered its independence in 471 BC. In the 13th cent. it became part of a Venetian duchy, was taken by the Turks in 1566, and now belongs to Greece. Fruit, olives, vegetables, tobacco, and grain are grown. Emery is found in abundance in the S. of the is. Pop. 20,000.

2. Cap. of the above is., is a port on the NW. coast and the seat of a Gk and of a Lat. bishopric. Pop. 2100.

3. The first Gk colony in Sicily, founded from Chalcis in Euboea, 735 BC. In 403 BC it was destroyed by Dionysius I of Syracuse; but 45 years later the

He was tried by Parliament for blasphemy, whipped, branded, and imprisoned for 3 years. He repented, condemned his error, and again became a valued preacher. His works were pub. in 1716. See also lives by M. R. Brailsford, 1927, and E. Fogelklou, 1931.

Nazaré: 1. Tn of E. Baía, Brazil, on the l. b. of the Jaguaripe, 32 m. W. of Salvador. Flour, coffee, and hides are produced here. Pop. 14,000.

2. (now called Nazaré da Mata) Tn in Pernambuco, Brazil, 35 m. NW. of Recife. It is a market centre in a sugar- and coffee-growing area. Pop. 6000.



Canadian Pacific

NAZARETH

scattered pop. was re-estab. at the new city of Taormeneium (*Taormina*).

**Nayar**, a people of Malabar, on the W. coast of India, famed for their matriarchal and extreme matrilineal social organisation. Traditionally they practised polyandry, women of a family living as a joint family, *taravad*, and bringing up their children as members of that family, their husbands merely visiting them but retaining no rights over their wives and children. The system is now in decay.

**Nayarit**, state of Mexico (cap. Tepic), stretching along the subtropical Pacific coast, with Sinaloa to the N., Durango to the NW., and Jalisco to the W. and S. It is watered by sev. rivs., notably the Santiago (lower Lerma). Tobacco is grown here. Area 10,547 sq. m.; pop. 290,100.

**Naylor, James** (c. 1617-60), Quaker, b. Ardsley, Yorks. He joined the parl. army in 1642 and was present at the battle of Dunbar, 1650. In 1651 he became a Quaker and one of their most persuasive preachers, travelling through England. He was imprisoned at Appleby in 1653 and at Exeter in 1656. Then, overstrained, and ensnared by a few flatterers, he allowed them to lead him into Bristol as Christ was led riding into Jerusalem.

(Both tns were formerly spelled Nazareth.)

**Nazarenos**, name applied by Tertullus (Acts xxiv. 5) to the early Christians, but later applied to a Jewish Christian sect, better known as Ebionites (q.v.).

**Nazareth** (modern *al-Nasira*), tn of Galilee, Palestine, midway between the Mediterranean and the S. end of the lake of Galilee, important for its connection with the life of Jesus Christ, who spent His early years there in the house of Joseph and Mary. No mention of N. occurs in the O.T. and its insignificance in the time of Christ may be hinted by the term Nazarene applied to Him in derision. Until Constantine N. was inhabited by Samaritans; it declined rapidly after the Arab conquest, revived during the Crusades and again in the 17th cent. when the Franciscans estab. a church on the traditional site of the House of Mary. It is now a tn of 15,000 inhab. and around its hills are orphanages and hospitals. The Franciscans have reconstructed the churches of the Annunciation and of St Joseph. The church of the Melkites is claimed to be the synagogue where Christ preached (Luke iv. 16). The general aspect of N., with its hilly background, orchards, cypresses, and churches, is that of some Tuscan hill tn.

**Nazareth Islands**, see CARGADOS.

**Naze**, The, cape on the E. coast of Essex, England, 5 m. S. of Harwich.

**Nazimuddin, Khwaja** (1894- ), second Governor-General of Pakistan. A member of a prominent Dacca family, he was educ. at Cambridge Univ., and called to the Bar. He was an influential collaborator with Jinnah (q.v.) in the Muslim League, where he was successively minister of education (1929-34), home minister (1937-41), chief minister (1943-5) in the then Bengal Gov., and, after the estab. of Pakistan, Premier of E. Bengal. He was knighted by the Brit. Gov. in 1934, but, in common with other prominent Muslim League members, he renounced the title in 1946. He succeeded Jinnah on the latter's death, as the second Governor-General of Pakistan, being sworn in on 14 Sept. 1948. After taking office he announced that the national memorials to the late *Quaid-i-Azam* (Jinnah) would take the form of a mausoleum, a mosque, a univ., and a national institute of technology. In 1951 he resigned as governor-general in favour of Mr Ghulam Mahomed to become Prime Minister after Liaquat Ali Khan (q.v.) had been assassinated. He retired from politics in 1952.

**Nazirites**, or **Nazarites**, among the anc. Israelites, those specially consecrated to the Lord and separated from the rest of the people. The Nazirite vow demanded: (1) Abstinence from intoxicating liquor and all the produce of the vine; (2) that the hair should never be cut; (3) avoidance of all ceremonial defilement, such as that involved by contact with a corpse. Early N. (e.g. Samson, Samuel, and the Rechabites) were vowed for life; but in later N.T. times the vow was temporary only, and its expiration was marked by a ceremonial offering, among other things of the cuttings of the hair (cf. Acts xviii. 18; xxi. 23 ff.).

**Nazis**, popular contraction of *National-socialistische Deutsche Arbeiterpartei*. The N., under the inspiration of Hitler, represented the revival of the *Nationalist* of the fatherland, the regeneration of the national and social life of Germany, and the rekindling of Ger. patriotism after a decade and a half of weak govts., which were sometimes strongly influenced by Communism. During this period unemployment was rife; there was corruption in public life, and the people as a whole suffered from an inferiority complex. Hitler succeeded in rallying the nation against the Communists and, in the elections, completely overwhelmed their leader, Thälmann. The incident of the Reichstag fire, too, enabled him to stage a dramatic trial of the alleged Communist incendiaries and thereby emphasised his ascendancy over them. Under Hitler the N. then carried out the 'Hitler revolution,' in which they assumed control of most of the police in Germany, banned the Social Democratic press, persecuted the Jews, issued emergency decrees for 'high treason,' instituted a Ministry of Propaganda under Goebbels (q.v.), replaced Braun as Prussian Prime Minister by Goering (q.v.),

dissolved the Catholic party, confiscated the funds of their chief political opponents, and disbanded the trade unions. After the official declaration that the revolution was accomplished a reign of terrorism ensued in which the N. mercilessly assailed all schools of thought opposed to their social and political outlook, driving thousands of persons into concentration camps. But the most characteristic feature of the Nazi persecution was Hitler's unremitting persecution of the Jews which began in 1933 and continued during the Second World War. The swastika or crooked cross, the symbol of the N., is related to Hitler's theory of Aryanism (q.v.); but the Nazi claim that the swastika was an anct. Teutonic or Nordic device is ill founded, for it is virtually a symbol of the sun and occurs in the relics of many earlier civilisations. The uniformed bodies of the N. played an important part in their success in gaining control of the reins of power. They include Storm Troops (*Sturmabteilung*), Security Corps (*Schutzstaffel*), and Hitler Youth (*Hitlerjugend*). See also GERMANY, *History*; HITLER, ADOLF; NATIONAL SOCIALISM; S.A. AND S.S.

**Ndola**, tn. of N. Rhodesia, commercial and distributing centre for the Rhodesian Copperbelt. N. is northernmost terminus of Rhodesia Railways. It has a copper refinery and a cobalt treatment plant. Pop. Europeans, 6000; Africans, 55,000.

**Neagh, Lough**, lake of Ulster, N. Ireland, largest in the Brit. Isles (17 by 10 m.). It receives the Blackwater and Ballinerry R.s. and is drained N. to the Atlantic through the Bann R. The shores are mostly flat and marshy, and its waters have a petrifying quality. There are canals to Belfast, Newry, Tyrone, and Lough Erne. There are a few is. in the lake and it abounds in fish. Area 153 sq. m.; average depth 40 ft. See Moore's ballad, *Let Erin Remember*.

**Neagle, Anna** (real name **Marjorie Robertson**) (1908- ), actress, b. London; married Herbert Wilcox, producer. She was a teacher of dancing, and a world championship finalist. Later she appeared in Charlott and Cochran revues, including *Wake Up and Dream*. She starred in *Stand Up and Sing*. 1931. Other stage appearances include *Peter Pan*, Jane Austen's *Emma*, and *The Glorious Days*. It is as a film actress, however, that she has achieved her greatest success. She won the International Gold Medal for the best actress of the year 5 times and the National Film Award for *Spring in Park Lane*, 1948, and *Odette*, 1951. Other films include *Good Night, Vienna*, *Bitter Sweet*, *Nell Gwynn*, *Peg of Old Drury*, *Victoria the Great*, *Sixty Glorious Years*, *Nurse Edith Cavell*, *They Flew Alone*, *I Live in Grosvenor Square*, *Piccadilly Incident*, *The Courtneys of Curson Street*, *Maytime in Mayfair*, *Lady with a Lamp*, *Ilacs in the Spring*, *King's Rhapsody*, and *My Teen-age Daughter*. Recently she has also turned to production. She was named a Commander of the British Empire in 1952.

**Neale, Sir John Ernest** (1890- ),

historian, b. Liverpool. He was educ. at Liverpool Univ. and Univ. College, London. In 1925 he was appointed Prof. of Modern Hist. at Manchester and 2 years later Prof. of Eng. Hist. at London. He is an outstanding authority on Elizabethan hist. In 1934 the James Tait Black Memorial prize was awarded to his biography, *Queen Elizabeth*. Later works include *The Elizabethan Political Scene*, 1948, *The Elizabethan House of Commons*, 1949, and *Elizabeth I and Her Parliaments, 1559-81*, 1953. He was knighted in 1955.

**Neale, John Mason** (1818-66), divine and hymn writer, b. London. He belonged to the extreme High Church party, and in 1854 estab. at Rotherfield the sisterhood of St Margaret, afterwards transferred to E. Grinstead. He wrote or trans. nearly one-eighth of *Hymns Ancient and Modern*, and pub. *A History of Peas*, 1841, *A History of the Holy Eastern Church*, 1847-73, and *Medieval Hymns and Sequences*, 1851, 1863. See J. Julian, *Dictionary of Hymnology*, 1907, and memoir by E. A. Towle (with list of writings), 1907.

**Neander, Johann August Wilhelm** (1789-1850), Ger. theologian and historian, b. Göttingen; in 1812 became prof. at Heidelberg and at Berlin in 1813, where he devoted himself to the advancement of Christianity. He lectured on Church hist., ethics, and systematic theology. His prin. work is the *General History of the Christian Religion and Church*, 1852, trans. by J. Torrey, and widely circulated in England and the U.S.A. Other pub. were *The Life of Jesus Christ in its Historical Relations*, 1848, *The Emperor Julian and his Times*, 1850, and *Memorable Occurrences from the History of Christianity and Christian Life*, 1852, etc. See the life by A. Wiegand, 1890.

**Neanderthal**, valley of the Rhine Prov., Germany, in the dist. of Düsseldorf, near the vil. of Mettmann. Here in 1856 was found the skeleton of a prehistoric man whose cranium had a low forehead and was large and thick, with large protuberances in the occipital region. Other skulls, bearing similar characteristics, have been found in the caves and quarternary strata in France, Belgium, Bohemia, Italy, Moravia, Gibraltar, Uzbekistan, and Asia Minor. It is an Upper Pleistocene, late Early and early Middle Palaeolithic form, whose potentialities have probably gone in to the making of ourselves.

The discovery in 1925 at Ehringsdorf, near Weimar, of a skull embedded in a travertine quarry seems to indicate that the men who lived in Germany in the preceding temperate period before the last or Würm glaciation set in must be assigned to the N. type in structural details. No evidence of the N. man's persistence after the earlier phase of this glaciation has been found anywhere. The Ehringsdorf man has generally been assigned to the Acheulean culture, but his tools are more akin in type to those of the Mousterian culture. While the skull

found at Ehringsdorf represents an early phase of Mousterian man the skulls found in Gibraltar and La Quina represent a late phase. If Ehringsdorf produced one of the latest finds in Europe, Gibraltar yielded the first N. skull—the skull of a woman known as Gibraltar I, found in a quarry at the base of the north face of the Rock in 1848. The parts of a second (Gibraltar II) skull were found in 1926 after an organised search in a rock shelter. This was the skull of a child in sev. parts. According to Sir Arthur Keith N. children must have assumed the appearance of maturity at an earlier age than modern children. He estimates the age of the child to have been about 5 at death, and that for this age it had a head and brain of truly remarkable size, and a larger jaw than the modern child of comparable age. The N. type, or at all events a variant of the extinct N. type, has been found near Tabgha, in Palestine (1925), and there is presumptive evidence that the shores of the Mediterranean were once inhabited by people of the N. or Gibraltar type. The man of La Chapelle-aux-Saints, also a modern discovery, is the largest-brained member of the N. species known to us. The cranial capacity of this skull measured 1625 c.c., nearly 150 c.c. more than in the average European man of to-day. The average cranial capacity of N. man probably exceeded that of modern man, and in potentiality for intelligence he was probably no less well endowed than ourselves. Two N. skulls found at La Quina in the dept. of Charente lay in deposits assigned to the upper or later Mousterian culture. As in the case of Gibraltar, one skull is attributed to a woman, while the other is thought to be that of a child; but in the shape of head—particularly in the length and narrowness of the skull—the 2 pairs of skulls differed greatly. Up to now anthropologists have not traced the dolichocephalic N. man by his fossil remains into the W. of Europe beyond the Channel Is., and, although his work floors have been found in England, no skull has yet been discovered there. See also ANTHROPOLOGY and MAN. See Sir Arthur Keith, *The Antiquity of Man*, 1915, and especially his *New Discoveries relating to the Antiquity of Man*, 1931.

**Neanthropic Man**, name given by anthropologists to the proto-Europeans or forerunners of modern Europeans. Their origin and lineage are very conjectural, and the fact that the differences between them and their Neanderthaloid predecessors are very marked enhances the difficulties of the problem (see NEANDERTHAL). The main problem is to account for the divergence of N. M. into races and for the geographic distribution of these races in past times. Sir Arthur Keith suggests that men of the Neanthropic type of the later palaeolithic period came from the SW. of Asia, where later the early pioneers of civilisation also made their appearance. See ANTHROPOLOGY.

**Neap Tides**, see TIDES.

**Neapel**, see NAPLES.

**Neapolis:** 1. Anct seaport of Philippi in Macedonia, the modern Kavalla (pop. about 5000) being near the site. The tn was almost opposite Thasos. St Paul landed here (see Acts xvi. 9-11).

2. Anct name for Naples (q.v.) in Campania, Italy.

**Nearchus**, commander of the fleet of Alexander the Great in his Indian expedition, 327-325 BC. He received command of the fleet ordered by Alexander to be built on the Hydaspes, and conducted it from the mouth of the Indus to the Persian Gulf, the whole journey taking from Sept. 325 to Feb. 324. Fragments of his own narrative of his voyage have been preserved in the *Indica* of Arrian.

**Nearctic**, see GEOGRAPHICAL DISTRIBUTION.

**Neath**, municipal bor. and riv. port of Glamorganshire, S. Wales, on a navigable riv. of the same name, 7 m. NE. of Swansea. An auxiliary fort was estab. at N. during the Rom. conquest of S. Wales (AD 70-80); the site of the Rom. fort was recently discovered and 2 gateways have been preserved. There are remains of an anct castle, and near by are the ruins of N. Abbey (founded 1130). N. has manufs. of tinplate, iron, copper, chemicals, and metal cans, and by-products of the coal industry. Briton Ferry, at the mouth of the R. N., and part of the bor. since 1922, was formerly the port for N. Pop. 33,300.

**Nebo**, see NABU.

**Nebraska**, one of the NW. central states of the Amer. Union, known as the 'tree-planter's state,' bounded on the N. by S. Dakota and Iowa, on the E. by the R. Missouri, separating it from Iowa, on the S. by Kansas, and on the W. by Wyoming and Colorado. Area 77,237 sq. m. There is much prairie land, a strip of 'bad lands' and sandhills (N. and NW.), and high land in the W. towards the Rockies, Niobrara Summit and Gabe Rock rising over 5000 ft. The Platte, Missouri, Republican, and Niobrara are the chief rvs.; Omaha (pop. 251,117) and Lincoln (cap., pop. 98,884) are the chief tns. Omaha has an airport. Agriculture is the leading industry, oats, maize, wheat, rye, and hay being the chief crops. Wheat, alfalfa, apples, and vegetables are grown in the SE. Irrigation is practised in the W. The livestock industry is only second in importance to agriculture. The chief mineral products are limestone, sand, potash, and clays from which bricks and tiles are made. Slaughtering and meat-packing, centred at Omaha, are important industries, also dairying and flour-milling. Educational institutions are, at Lincoln: univ. of N., Union College, and N. Wesleyan Univ.; at Omaha: univ. of N. College of Medicine, Creighton Univ., College of St Mary, Duchesne College, and univ. of Omaha; others are Dana College (Hastings), Midland College (Fremont), and York College (York). There are also 5 state teachers' colleges. What is now known as N. was ceded by France to Spain in 1762, returned to France in 1801, and purchased by U.S.A. in 1803 as part of the Louisiana Purchase. N. ter. was organ-

ised in 1854; the state was admitted to the Union in 1867. There are 93 cos. Since 1937 N. has had a single-chambered legislature of 43 senators. Two senators and 4 representatives attend Congress. Pop. 1,325,510. See J. A. Morton, *History of Nebraska*, 1913; A. E. Shedd, *Nebraska Old and New: History, Stories, Folklore*, 1937; G. E. Condra, *Geography, Agriculture, and Industries of Nebraska*, 1942.

**Nebriša**, see LEBRIJA.

**Nebuchadnezzar**, or **Nebuchadrezzar** (Babylonian *Nabu-kudurru-usur* — 'O Nabu guard the boundary'), King of Babylonia (605-561 BC). According to the Babylonian Chronicle N., while crown-prince, defeated the Egyptians at Carchemish. Thereafter in a series of campaigns he subdued Syria and Palestine, sacked Askelon, and defeated the Arab tribes. On 16 Mar. 597 BC N. seized Jehoiachin and Jerusalem which again, under Zedekiah, rebelled and was destroyed in 586 BC (see 2 Kings xxiv and xxv). Despite an earlier defeat in 601 N. appears to have invaded Egypt, c. 568 BC. He rebuilt Babylon and neighbouring cities extensively, helped by his queen Naqia (Nitocris). See also BABYLONIA. See D. J. Wiseman, *Chronicles of Chaldaean Kings*, 1956.

**Nebulae**. The invention of the telescope made possible the recognition of many stars invisible to the naked eye. Nevertheless, except for the sun, the stars are at such enormous distances from the earth that they appear as mere points of light even when viewed by the most powerful of modern telescopes. In the 18th cent., however, the telescopes of Herschel and others led to the discovery of celestial objects that presented a cloudy appearance, and they were designated N. During the 20th cent. much has been discovered about N., which here can only be summarised. N. are divided into 2 main classes: those within our *galactic system* (q.v.) and those outside the galaxy, known as the *extra-galactic N.* In the galactic system 2 types of N. are found, known as the planetary N. and the diffuse N. The former have relatively small angular dimensions and are wisps of gas enveloping very hot stars which render them luminous. Most of them have disks which are elliptical in shape, hence their designation as 'planetary N.' It is believed that they were once novae (q.v.) which they resemble in some ways. Two well-known examples of this type are the Owl Nebula in Ursa Major and the beautiful Ring Nebula in Lyra. Diffuse N. are irregular in shape and have larger dimensions than the planetary N. They consist of gases in an extremely attenuated form, some of them presenting the appearance of dense clouds, while others appear as a faint haze. One of the finest of them, in the constellation of Orion, is visible on a clear night to the naked eye, surrounding the middle star of the Giant's sword. To the modern astronomer and philosopher the extra-galactic N. are the most important, because they are island universes on the same footing as our



galaxy, of which the solar system is only a very minute part. The Great Nebula in Andromeda is one of this class and can be seen with the naked eye; the light from it takes nearly 900,000 years to travel to the earth, yet it is one of the nearest of the extra-galactic N. Recent research, however, has suggested that the distances given for the extra-galactic N. should be doubled (*see further under STAR*). The number of stars in these N. varies but is comparable with the number in our galaxy, i.e. about 100,000,000,000. The

the main body of the sun. These fragments condensed under their own gravitational attraction, and became the planets that continued to describe orbits round the sun under its gravitational attraction. Laplace's hypothesis has since been abandoned. While it may be true that stars originate from nebulae in the manner indicated by Laplace, this accounts only for the creation of our sun. According to Sir James Jeans's tidal theory the solar system was created from the original sun by the close approach



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THE GREAT NEBULA IN ORION  
60-in. reflector at Mount Wilson.

largest optical telescope (the 200-in. at Mt Palomar (q.v.)) has photographed N. more than 2,000,000,000 light years distant and the number contained in this space is estimated to be sev. thousand million. It is impossible to see individual stars in these very far off N., which appear as a faint luminosity due to the combined light of the stars composing them. *See NEBULAR HYPOTHESIS and RADIO ASTRONOMY.*

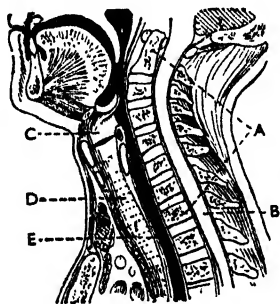
**Nebular Hypothesis**, an attempt to explain the origin of the solar system as an evolution from a nebula. Swedenborg and Kant both put forward tentative explanations of this kind, but Laplace (q.v.) was the first to develop a N. H. on strictly scientific lines. Briefly his hypothesis imagined that rotating nebulae were first formed by the condensation of gaseous matter, and that the sun was originally a nebula of this type. As the nebula continued to shrink, it rotated faster and faster, until fragments broke away from

of a larger star that raised tides of such violence in the sun as to cause fragments to be torn off it to form the planets, comets, etc., that with the sun constitute the solar system (q.v.). Many years ago this theory was shown by Prof. H. N. Russell, an Amer. astronomer, to be untenable. Although sev. other theories have been advanced in recent years, these have not been accepted, and the origin of the solar system still remains one of the unsolved problems of astronomy.

**Necessity**, specialised term in philosophy, religion, and logic implying causality and certainty when not deduced by restricted laws of formal reasoning. Logically the law of N. compels us to admit the truth of a conclusion or judgment based by laws of reason on other propositions already accepted, or, more particularly, as axiomatic, resulting from the evidence of 'common sense.' Mathematical conclusions are thus necessary: e.g. it is axiomatic that 2 straight lines

cannot enclose a space. Among the anct philosophers and medieval schoolmen appeal to N. was extremely frequent, but with the advent of natural science and its inductive processes, dating from Bacon's *Novum Organum*, a vast class of necessary truths has been brought within the realm of logical demonstration, or embraced within the realm of theory, i.e. subject to further investigation. It is, however, in philosophy and religion that the doctrine of N. assumes importance, greater perhaps since the rapid rise of the theory of evolution and its popular exaggeration over too wide a sphere. N. would imply mechanical processes, as it were, in the whole universe, a view generally held to be incompatible with the operations of human and divine will. But for moral N. see CALVIN; DETERMINISM; KANT; LEIBNITZ; WILL; etc.; also PSYCHOLOGY.

**Neck**, in geology, the name given to columns of cooled lava which fill up an old volcanic chimney or crater. Up these passages or conduits volcanic materials were forced. N.s are characterised by a more or less circular pipe filled with consolidated ashes, or with crystalline lava. They vary considerably in size, from 20 yds in diameter to sev. m., and may be simple or complex in structure. They occur in all old volcanic dists., examples existing at Largo Law, Fifeshire; Arthur's Seat, Edinburgh; Dumbarton Hill; the Lothians; Derbyshire; in Auvergne; the Eifel; Bohemia; St Lucia (W. Indies, 'the Pitous'), Texas; California; and many of the W. states of N. America. The famous diamond mines of Kimberley, S. Africa, are another example, the blue-ground (serpentine breccia) occupying great funnels. See Sir A. Geikie, *Text-book of Geology*, 1882, 1924.



DIAGRAMMATIC SECTION OF  
THE NECK

A, cervical vertebrae; B, spinal cord;  
C, larynx; D, trachea; E, oesophagus.

**Neck**, portion of the body joining the head and trunk, also a constricted portion of any structure serving to join its parts. The bony structure of the N. is the cervical portion of the spinal column (see SPINE) consisting of 7 vertebrae. The spinal column contains the spinal cord, which in

the cervical region is oval in section; the amount of grey and white matter becomes increased in quantity. The blood is carried to the skull by the right and left common carotid arteries, and is returned by the jugular vein, which may be felt a little below and behind the angle of the jaw, after which it penetrates rather more deeply into the tissues. The N. also contains the gullet (q.v.) or food passage and the windpipe. The larynx (q.v.), or organ of voice, occupies a position where the windpipe connects with the pharynx (q.v.), and the form of one of its cartilages produces the projection known as Adam's apple. The thyroid gland (q.v.) lies just below the larynx and in front of the upper part of the trachea.

**Neckar**, riv. of Germany, which rises on the E. slopes of the Black Forest (q.v.), and winds, generally NW., past Tübingen, Stuttgart, Heilbronn, and Heidelberg, to join the Rhine at Mannheim (qq.v.). It is navigable for small vessels as far as Stuttgart. Length 225 m.

**Necker, Jacques** (1732-1804), Swiss financier and statesman of France, b. Geneva. Sent to Paris in his youth he joined the house of Thellusson, the banker, who took him into partnership. Married Suzanne Curchod, 1764 (see NECKER, SUZANNE CURCHOD).

During 12 or 13 years N. acquired a large fortune and retired. He then wrote sev. works on financial affairs. His *Éloge de Colbert* obtained a prize from the Fr. Academy. He afterwards wrote a memoir upon the Fr. finances, which so delighted Maurepas that he obtained for him the appointment of director of the Treasury (1776) and director-general of finances (1777), when, being against imposing new taxes, he endeavoured to make up the deficiency in the income by economy and loans. In 1781 he pub. *Compte rendu présenté au roi*, which disclosed the state of the revenue and expenditure of France. Shortly after this he resigned, withdrew to Switzerland, and wrote *De l'administration des finances de la France*, 1784. In 1788, on the resignation of Brienne, Louis XVI appointed N. director-general of finances. His second ministry was short, and he again retired to Switzerland, but after the taking of the Bastille the National Assembly demanded the recall of N. and Louis complied. He resigned in 1790, and spent his remaining days in Switzerland, writing political tracts. His daughter was the celebrated Mme de Staël. The memoirs of his private life were written by her, and the *Notice sur la vie de M. Necker*, 1820-1, by his grandson. See P. de Ségur, *Au Couchant de la monarchie Louis XVI et Necker*, 1776-81, 1913, and O. d'Haussonville, *Mme de Staël et M. Necker d'après leur correspondance inédite*, 1925.

**Necker, Suzanne Curchod, Madame** (1739-94). Fr. writer, b. Geneva, Switzerland, noted for her beauty, wit, and wide learning. After her marriage in 1764 to Jacques N. (q.v.), her house in Paris was a rendezvous of all the distinguished men of the day. She wrote *Réflexions sur le*

*divorce* and *Mélanges*, pub. by her husband after her death. She was the mother of the famous Mme de Staël. See G. PARY, *Mme Necker, her Family and her Friends*, 1913.

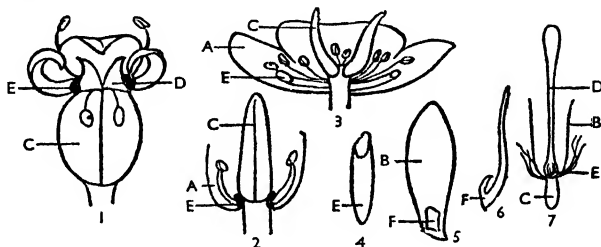
**Necklace, The Diamond**, see DIAMOND NECKLACE, THE.

**Necromancy**, mode of divination practised by the ancients by which the spirits of the dead were conjured up to answer certain questions about the future. In Homer's *Odyssey* the shade of Tiresias is brought up and consulted by Ulysses, and the witch of Endor is an example from O.T. hist. See DIVINATION.

**Necropolis** (*nekros*, dead; *polis*, city),

convert it into honey in their honey-sacs, by the action of enzymes invertase and diastase, changing sucrose into fructose and glucose. The honey is given up to other bees in the hive which store it in the combs. Also the drink of the gods, described by Homer as a red wine which Itebe pours out for the immortals (*Iliad* xix. 38 and iv. 3). N., in Gk mythology, had the power of conferring immortality on all who partook of it. The term is applied figuratively to any delicious drink, such as that made from sweet wine and honey.

**Nectarine**, smooth-skinned and generally more crimson-coloured variety of the



NECTARIES

A, sepal; B, petal; C, ovary; D, style; E, nectary; F, scale covering E.

(1) Section of Umbellifer: the nectary is a disk formed from the swollen bases of the styles. (2) Wallflower: nectaries lie internal to the base of the stamens. (3) Christmas Rose: nectaries are tubular petals. (4) Tubular petal from (3). (5) Petal of Lesser Celandine, front view. (6) Side view of (5). (7) Coltsfoot: disk nectary lies within the corolla tube at the base of the style.

cemetery or burying-ground. The name was formerly applied to cemeteries in the vicinity of ancient cities, especially to a suburb of Alexandria, but is now used in a more extended sense for any large burial-ground. Ancient examples remain in Africa (Cyrene and the Egyptian Pyramids), Asia Minor, Greece, and Italy. See A. Bruckner, *Friedhof aus Eridanos*, 1909; R. Pagenstecher, *Nekropolis*, 1917; G. Karo, *An Attic Cemetery*, 1943.

**Necrosis**, death of a circumscribed portion of tissue surrounded by living tissue. The causes of N. are direct injury, obstruction in the circulation of the part, or incompetence in the nutritive agencies in the tissues affected. In coagulative N. an amount of fibrin is formed; this occurs in the blood and on the surface of mucous membranes, where a false membrane may be formed, as in diphtheria (q.v.). In liquefactive N. the action of autolytic enzymes liquefies the dead tissue. See also CARIES and GANGRENE.

**Nectar**, sweet juice secreted by the flowers of many plants in special sacs or glands called nectaries. It attracts insects which are instrumental in cross-pollination. N. consists of about 20 per cent sucrose (cane sugar) and 80 per cent water, plus traces of mineral salts, acids, etc. Insects, such as bees, collect N., and

peach, which can often be grown successfully outdoors against a S. wall, in a well-drained border of fibrous loam containing a good proportion of lime. Protection at the time of flowering against spring frosts and cold winds is very essential, as the flowers appear early and before the leaves. Planting is best done in Sept., against walls; trees trained fan-shape are best. The culture of N.s under glass, particularly when grown in pots, is attended with excellent results, if free ventilation and liberal watering are provided, and over-cropping is avoided. See PEACH.

**Nectary**, usually a gland-like nectar-secreting body or disk on the receptacle of a flower, either between the petals or between the stamens and pistils. In some cases the N. occurs on the summit of the ovary; in others it lines the inside of the calyx-tube; and occasionally sepals or petals are modified, and in a few cases (such as the monkshood, Christmas Rose, and hellebore) are entirely converted to serve as N.s. The accessibility of the N. is perfectly adapted to the structure of the insect or other agent on which the pollination of the flowers mainly depends.

**Nedim** (fl. c. 1700-30 under Ahmed III), Turkish poet of the 18th cent., of the old Ottoman school. His 'ghazals' and

'qasidas' are marked by grace and originality. He was custodian of the library at Constantinople, founded by Ibrahim Pasha.

**Needham**, tn of Massachusetts, U.S.A., in Norfolk co., 10 m. WSW. of Boston, with manufs. of hosiery, knitted goods, rubber thread, elastic goods, and surgical and dental instruments. Pop. 16,313.

**Needle**, *Magnetic*, see COMPASS, MAGNETIC.

**Needle Gun**, see FIREARMS, Breech- and Magazine-loading Rifles.

**Needle-point Lace**, see LACE.

**Needles**. There are 7 different groups of N. which may be listed as follows:

*Hand-sewing needles*. Prior to the Second World War these were manuf. in large quantities in Japan, Germany, and the U.K. Since the Second World War manuf. of N. in China has very greatly increased, but no reliable figures are available. Eng. manuf. of N. is concentrated at Redditch in Wores. Sewing N. are made from 5-gauge carbon steel rod, which is drawn down to the requisite thickness by a series of holing and annealing operations. The resultant wire is then cut into 2-needle lengths, sharpened at both ends by automatic grinding, and passed into the making shop, where the N. are loaded into combine machines, set up for the particular type and gauge required; these grip each needle individually in a wormed feed, and carry it between 2 stamping dies, which mark the impression of 2 eyes, facing in opposite directions, in the centre of the 2-needle length. The wire is then carried forward on the same feed and the centre of each eye is punched out cleanly, the flash clipped off, and the wire broken apart in the centre to form 2 N. Tied into bundles of approximately 50,000 the N. are then passed over rotary grinding wheels which, working with extreme accuracy, remove all remaining roughness around the head and eye. Hardening and tempering are done in electrical furnaces which, by being kept air-sealed, keep the surface of the needle bright throughout the heat treatment. To remove all signs of grinding, stamping, or scale, the needle is then submitted to a particularly individual process known as 'scouring.' The N. are wrapped in long cylindrical parcels of hessian with a dressing of liquid soap and emery powder. This parcel is then bound together with cord and placed between one stationary and one sliding surface, which roll the parcel backwards and forwards between them under very considerable pressure for many hours. On their removal the N. are polished in a similar machine, cleaned, and nickel plated. Each needle is then inspected by hand and any necessary finishing, such as gilding, bluing, etc., is carried out. Finally the N. are either stuck in cloth or packed loose into packets for final dispatch to the customer.

*Hardware needles*. Prior to the Second World War Germany was the greatest manufacturer of these, followed by Great Britain; but since the Second World War China has also started their manuf. The

term covers all special N. used by trades other than tailoring or dressmaking, such as shoemakers, upholsterers, mattress makers, snail-makers, etc. Their manuf. is comparable to hand-sewing N., with which they overlap at certain points.

*Hosiery needles, or latch needles*. Chief manufacturer of these N., used on industrial knitting machines, is Canada, followed by Germany, Great Britain, and Switzerland. In the finer sizes their production calls for great accuracy and craftsmanship, but it is not individual in the same way as needle-making, and has more in common with normal light engineering.

*Surgical needles, or suture needles*. These are made in Germany, Great Britain, and in small quantities in America. All surgical N. have triangular cutting points, similar to gloves' N. This is to minimise tearing of the skin. They may either have an eye, similar to hand-sewing N., or be eyeless, as in non-traumatic N. where the gut is attached permanently to the body of the needle so that no eye is necessary.

*Knitting needles*. Manuf. of these is confined to no particular country, since the processes are very simple, particularly when worked in plastic. For ordinary domestic knitting they are made of anodised aluminium, plastic, nickel-plated steel, bone, or wood.

*Machine needles*. Manuf. of these N. is in many ways comparable to that of hand-sewing N., and prior to the Second World War 80 per cent of the whole production was concentrated in Germany, the remainder being made in the U.S.A. and a few in Great Britain.

*Gramophone needles*. These are really a by-product of the hand-sewing needle industry, and are manuf. wherever these are made, notably in Japan, China, Germany, and Great Britain.

**Needles**, The, name given to 5 remarkable rocks lying immediately off the W. extremity of the Isle of Wight (q.v.) in N. lat. 50° 39' and W. long. 1° 34'. Their origin is attributable to the sea beating on the sharp cliffs which form the W. point of the is., and the same influence is gradually wasting them away; the largest of them, which was 120 ft in height, was undermined and fell during a storm in 1764. They are white, but black at their bases, and curiously streaked throughout with black strata of flints. A lighthouse standing on this extremity of the is. rises 715 ft above the sea.

**Needlework**, work done with a needle and thread on cloth. Since sewing machines, invented in 1830, came into general use at about 1870, machine-sewing has superseded much that was done in the past by hand, but plain hand-sewing is the foundation of all other needlecraft. N. is one of the oldest crafts, and though it is primarily employed to join pieces of material to make a garment, it is also used for forms of decoration, e.g. tucking, quilting, etc. Two classes of stitches are used in garment-making, temporary and permanent. The temporary stitches are straight-tacking, and tailor-tacking or

thread-marking, the latter being used for marking the fitting line on 2 identical parts at the same time. There are a number of permanent stitches: these are used for joining parts of garments, for holding down turned edges, for protecting raw edges, for disposal of fullness, and for decoration. Permanent stitches include running, oversewing, ordinary hemming, slip hemming, invisible hemming, herring-bone stitch, and buttonhole stitch. Feather-stitching and scalloping are particularly decorative forms of permanent stitching. The same form of seam is used throughout a garment, the choice of seam depending on the nature of the material and the purpose of the garment. Fr. seams, for example, are used in materials that are not too thick and bulky, such as thin lingerie and outer garments of transparent material, e.g. nylon. A run and fell seam is used when a strong flat seam is required, one row of stitching being visible on the right side. Flat seams should always be used on garments which are to be worn next to the skin in order to avoid friction, and the seams should fall to the back. Open seams are frequently used on outer garments, and no stitching shows on the right side, and the seams can be pressed open so as to be almost invisible. Raw edges inside the garment can be made neat by cutting a tooth-like edge, or by using a narrow binding, or loop stitching.

**Darning and patching.** Some knowledge of patching and darning is indispensable in the home. Patching is generally applied to outer garments and large repairs to under-garments; darning is used on knitted fabrics. In all repair work the general condition of the garment, the cost of replacing it, and the time to mend it are factors in governing the choice of method, which is as important as suitability of method to material. Special attachments, which can be used on a sewing machine, e.g. a darning foot, facilitate repair work. Darning is a method of replacing worn threads, as distinct from patching, which is the insertion of whole pieces of material, and can often be made less obvious than patching. The hole or thin place is filled with threads carefully chosen to reproduce as nearly as possible the original web. Swiss darning is frequently employed to repair a hand-knitted garment, as actual new knitting stitches are made. The general principles of patching are similar to those of darning, i.e. the material of the patch is chosen to match that of the garment in colour, texture, and age. The patch is generally placed on the wrong side of the garment. Adhesive patches can now be bought.

Good N. is an essential foundation for the more exacting and complex stitches used in various types of embroidery and other needlecrafts. See also articles on DRESSMAKING; EMBROIDERY; LACE; SAMPLER. See E. Griffith, *A Manual of Plain Needlework*, 1934, 1944; Gladys Fry, *Embroidery and Needlework*, 1935; Anna L. Hird, *Principles and Practice of Needlework and Dressmaking*, 1942; W. Bull, *Basic Needlework*, 1954.

**Neenah and Menasha**, twin cities in Wisconsin, U.S.A., on opposite sides of the Fox R. at the N. of Lake Winnebago, 90 m. N. of Milwaukee. They produce paper, paper products, printing, wood and metal products, machinery, and flour. Pop. about 12,400 each.

**Neer, Aert van der** (1603-77), Dutch landscape painter, b. Gorkum. He was particularly successful in rendering moonlight effects among the canal scenery of Holland, and in painting winter landscapes, with skaters on ice.

**Neer, Eglon van der** (1634-1703), son of Aert van der N., b. Amsterdam. He was a pupil of Vanloo, and became celebrated as a painter of historical pieces, landscapes, etc.

**Ne Exeat Regno.** At common law (q.v.) every subject may go out of the realm whenever and for whatever purpose he pleases; but because constitutionally every man ought to defend the realm, the sovereign has the prerogative (see *Crown*) of commanding him by the writ of N. E. E. not to leave the country, on pain of punishment for disobedience. This anct writ was originally used to prevent the clergy from going to Rome, and was afterwards extended to laymen who were suspected of concerting schemes against the state. It has now become a part of the ordinary process of the high court by virtue of which bail (q.v.) may be obtained from any person about to go abroad with the object of evading the jurisdiction of the court. The legality of this application of the writ was in the time of Charles II.

**Nefertiti**, wife of Akhnaton (q.v.), King of Egypt in the 18th dynasty. A remarkably sculptured head of the queen, one of the finest extant specimens of Egyptian art, was discovered at Tell el Amarna, and is now in the Dahlem Museum in West Berlin. This head has greatly influenced the modern European ideal of feminine beauty.

**Negapatam**, or Nagapattanam, tn and small port of Madras state, India, on the Coromandel coast 48 m. from Tanjore. N. was an early Portuguese settlement. Apart from coastal traffic there are sailings to Malaya.

**Negeb** (Negev), The (Heb. 'south country'), semi-desert triangular-shaped region of Israel, extending from a base S. of Beersheba to an apex at the head of the Gulf of Akaba, 70 m. distant. Area about 4500 sq. m., or more than half the total area of Israel. The Negeb stands comparatively high on a wind-swept, sun-scorched plateau which slopes up gradually from the foothills of the Sinai peninsula to the high cliffs to the E. that overlook the Wadi Araba. It is mentioned frequently in the Bible under the names of various 'wildernesses.' Solomon and Jehoshaphat built fleets at Ezion-Geber to trade with the E. Later the Negeb was an important dist. of the Nabatean kingdom (N. Arabia). Trade routes were developed and sev. townships sprang up. The ruins of Nabatean civilisation—with great cisterns for the storage of drinking water—were excavated by Sir Leonard

Woolley (q.v.) and T. E. Lawrence (q.v.). Thereafter the Negeb dwindled into obscurity, inhabited only by the nomadic Bedouin. Under the Brit. Mandate for Palestine it was little developed, although the Jews made some land purchases and claimed it could be a great settlement area for the future. The strategic value of the Negeb as a bridge between Egypt, Transjordan, and Arabia was recognised by all sides, and the possibility always remained of the discovery of petroleum.

The Negeb was assigned to the Jewish state by the U.N. partition resolution of Nov. 1947, but in the course of the fighting in Palestine from May to July 1948 the Jews had not made good their claim. They rejected a proposal by Count Bernadotte, the U.N. mediator, to abandon their claims to the Negeb, in exchange for W. Galilee which they already held (although W. Galilee had originally been assigned to the Arabs), and in a series of campaigns from Oct. to Dec. 1948 occupied the whole of the Negeb. Since its incorporation in Israel, the Negeb has recovered something of its old prosperity. Beersheba is now a tn (pop. 17,000) connected by rail to Tel-Aviv and by good roads to the phosphate works at Sodom and the Red Sea coast. Numerous agric. settlements have been estab. in the N. Negeb, aided by the opening, in 1955, of a 66-in. pipe line bringing water from the R. Yarkon 70 m. distant. The small port of Elat has been built opposite Akaba. In the N. Negeb, near Gaza, oil has been discovered in small quantities. The development of the Negeb seems to be the only solution to the grave economic problems which have beset Israel since its inception, and presents the same challenge as the opening of the W. did to the pop. of the U.S.A.

**Neghelli, Marchese de**, see GRAZIANI.

**Negligence**. In Eng. law the commonly accepted definition of N., which is a tort (actionable wrong) remediable by an action of damages, is that it is the omission to do something which a reasonable man, guided by those considerations which ordinarily regulate the conduct of human affairs, would do, or doing something which a prudent and reasonable man would not do. The 2 cardinal facts of importance about N. are that it denotes a standard of conduct and not a state of mind, and that liability from it arises only where a duty is owed to the person aggrieved. In regard to duty, liability for N. may arise from the breach of duty owed to a particular individual, or to all persons indiscriminately. In the former case the personal duty may either be incident to some fiduciary (e.g. trustee and beneficiary), parental, or tutelary (guardian and ward) relationship, or exist by reason of a purely contractual relationship. In the case of N. manifested in performing or omitting to perform the terms of a contract, difficult questions arise as to whether the injured party should sue in contract or in tort, the practical difference being that the measure of damages in the former case will be the loss he may be reasonably supposed to

have sustained as a proximate consequence of the breach (q.v.), but in the latter case he may get anything a sympathetic jury sees fit to award. In regard to duties 'owed to all the world,' it is to be observed that these are necessarily of a restricted nature; and the bond of duty in most cases where the courts have held it to exist will be found to depend really on an antecedent voluntary act of the party held liable; e.g. if I observe a cart and horse, the driver of which (a personal enemy of mine) has temporarily left it unguarded, proceeding to the brink of a steep cliff, I am not liable for damages for N. because I do not take the trouble to stop the horse from walking over the cliff. But if, for example, I choose to run motor-buses or any other vehicle along the streets, I am responsible for any injuries sustained therefrom by passers-by which a jury or judge of fact is satisfied were due solely to the N. of my drivers. This example is useful to illustrate the meaning of 'contributory' N.: a person who might otherwise be entitled to damages for injuries or loss sustained by the N. of another was disentitled to recover a farthing if, notwithstanding the other's N., he himself could, at the decisive or last moment in the transaction, have by the exercise of reasonable care and prudence averted such injury or loss. By the Law Reform (Contributory Negligence) Act of 1945, however, such a person is now entitled to recover damages, though the amount is reduced proportionally to his share of responsibility. It is commonly said that N. is divisible into gross, slight, ordinary, and so forth. But the div. is unsound and illogical. No doubt what would be gross N. in a bus driver would be usually far less so in the case of an inexperienced man who was learning how to drive. But this will not affect the liability, for the law requires the standard of care or skill of the expert in a case where special skill is ordinarily to be expected; though, of course, in the above example the inexperienced driver would probably incur no liability if, for example, he were a passenger who had tried to stop a bus on the sudden illness of the regular driver.

**Negombo**, tn of Ceylon, on the W. coast, 20 m. NW. of Colombo. There is trade in cinnamon and a fishing industry.

**Negotiable Instrument**. The distinguishing features of a N. I. are: (1) it can be sued on by the holder in his own name; (2) the holder in due course is not affected by defects in or lack of title of his transferor or previous holders; (3) property in it passes by mere delivery; and (4) the holder in due course is not affected by certain defences which might be available against prior holders, e.g. fraud, undue influence, provided he himself were no party to such vitiating element. The law of N. I.s depends mainly upon statutes which themselves have been framed exclusively on the custom of merchants. The earliest forms of N. I.s were bills of exchange (q.v.), borrowed from the practice of Venetian and Florentine merchants in the Middle Ages, and, though much later, promissory notes. The list of N. I.s

tends to increase, one of the latest additions being debenture bonds payable to bearer. In the majority of cases it is essentially a question of fact to be proved by evidence whether or not a document is negotiable, though in cases where the negotiability is established, the court takes judicial notice of that fact, i.e. recognises it as a matter of law. The following documents, in addition to those already mentioned, are N. I.s: bank-notes, cheques, exchequer bills, dividend warrants, E. India bonds, circular notes, certain scrip and bonds, e.g. debenture scrip and various Amer. railway bonds. The law of N. I.s so far as bills of exchange, promissory notes, cheques, and bank-notes are concerned has long been codified in the Bills of Exchange Act, 1882. Postal orders are not negotiable if crossed for collection by a bank, though otherwise they can be freely transferred from hand to hand; nor are share certificates, share warrants, and share transfers, hence the forgery of the true holder's signature will not affect his rights; nor an IOU (q.v.); nor most kinds of scrip and bonds. Bills of lading can be transferred so as to give the transferee a right to sue in his own name, but otherwise they are not N. I.s because the transferee gets no better title than that of his transferor; and the same observations apply to policies of assurance. The holder in due course of a bill of exchange or any other N. I. is he who takes the instrument in good faith or without knowledge or notice of previous defects of title in it, and gives valuable consideration (*see CONSIDERATION*) for it. But a holder is not put to the trouble of proving consideration unless the party resisting liability on the instrument establishes the existence of some defect, e.g. fraud, duress, in the previous negotiation of the instrument. Sometimes bills or other N. I.s are marked 'not negotiable.' The effect of this is that the person receiving it will not have, and is not capable of giving, a better title to the instrument than that which the person from whom he took it had. But though the true owner is thus protected, the negotiability of the instrument is not otherwise affected in any way.

**Negri, Ada** (1870-1945), the only Italian poetess to whom the critics of her native land have given the title of 'great.' b. Lodi. She came from a working-class family and was a school teacher at first in Lombardy and later at Milan. She married a rich business man, from whom she soon separated. Her first book of verses was published when she was only 22, and her success was rapid. Her early books were the chants of an authentic daughter of the people, and were filled with a sense of revolt at things as they are. In her later works, her rhymes lost some of their spontaneity and became more classical in form although her themes were still humanitarian and feminist. Among her books of poems were (title trans.) *Fatality*, 1892, *Tempests*, 1896, *Maternity*, 1904, *Exile*, 1914, and *Prayers*, 1918. The shock of the First World War turned her talents to prose. *The Book of*

*Mara*, which appeared in 1919, recites with feminine audacity the death of a young lover. In *Stella Maitutina*, 1923, she gave a lyrical evocation in poetic prose of her infancy. *See studies by N. Podenzani*, 1930, and V. G. Galati, 1930.

**Negri Sembilan**, state of the Federation of Malaya (q.v.). Prior to 1946 it was one of the 4 states comprising the Federated Malay States, under Brit. protection. It is situated on the W. coast of the Malay Peninsula to the S. of the states of Selangor and Pahang. Its area is about 2600 sq. m. Its pop. of 345,700 (1957) consists of Chinese, Malays, Tamils, Europeans, and Eurasians. It is bordered on the N. by Selangor, S. by Johore and Malacca, E. by Pahang, and W. by the straits of Malacca (q.v.). It has a coastline of about 29 m. Its surface is diversified. The upper valleys and mts are densely wooded, the lower are fertile, producing rice and fruits in abundance. The main mt range of the Malay Peninsula ends in N. S., and the watershed between the E. and W. coasts in the S. part of the state is not mountainous. Gunung Besar Hantu, on the Pahang border, is the highest peak (4799 ft), while the highest peak within the borders is Telapak Burok (3915 ft). The country is drained eastwards by the K. Moar, but there are no large rivers. There is only one port, Port Dickson, which is connected with the seat of gov., Seremban, by a railway 24½ m. in length. Agriculture is the main industry. Tin is worked in considerable quantities and large numbers of elephants, buffaloes, and other cattle are reared. N. S. is a confederation of 9 states. Sungai Ujong, one of the larger of these, is mentioned in a Javanese poem in AD 1365 as being subject to the Javanese empire of Majapahit, *see MALAYA (HISTORY)*. In the 15th cent. N. S. was ruled by chiefs of the old kingdom of Malacca. After the capture of Malacca from the Portuguese by the Dutch and Johore Malays in 1641, Johore took a leading part in the politics of N. S. until 1773, when the chiefs of the present-day leading states of the confederation invited a Sumatran prince, Raja Melewar, ancestor of the present ruler, to preside over it.

In 1874 the president or *undang* of Sungai Ujong (which is the most important of the 9 small states) invited the assistance of the Brit. Gov. in maintaining his rule, and a Brit. resident was appointed, and various others of the 9 states followed this example. Later a confederation known as Old N. S. was formed and in 1895 the resident of this confederation took charge of Sungai Ujong and of Jelebu, and the modern N. S. was constituted. Finally in 1898 the Yang Di-pertuan Besar of Sri Menanti (who at one time presided over the whole of N. S.) was again elected titular ruler of the whole state. The present ruler of N. S. succeeded to the throne in 1933 and became first paramount ruler of Malaya, 1957.

**Negrillo**, *see* **NEGRITO**.

**Negrito**, or **Negrillo**, name originally

applied by the Spaniards to the Negro-like inhab. of the Philippine Is., an aboriginal race, somewhat dwarfed, inhabiting the mts. They are of an extremely low type, having no dwellings, living on wild fruits and roots, and on animals they can procure with their only weapon, the bow and arrow. The name has been extended to cover many other peoples. Besides the Aëtas or Philippine Negritos, there are many tribes scattered over the mountainous regions of the Malay Peninsula, such as the Jakuns, Sakais, and Semangs, and the Andaman islanders or Mincopies, who are much purer than the others, who have intermixed with the Malay races. These form the E. div. of the race. In Africa there are sev. tribes inhabiting the equatorial forests and the mountainous regions round the great lakes, the pygmies of the Congo and Okoway. Among these are the Wochua and Akka, inhabiting the basin of the R. Welle, N. of the Congo; the Batwa, about the R. Kasa and its tribs.; the Obongo, in the W. forests of equatorial Africa; in Masalland the Wandrorobo; and in S. Galla-land the Dume. As in the case of the Negroes, this race appears to have spread originally over the Indo-African continent, now submerged. There is marked likeness to the Negro in colour, nature of the hair, and protruding jaws; they are, however, of low stature, 3 ft 6 in. to 4 ft 10 in., and have 'brachycephalous' heads. In intelligence and morality they show marked similarity to the Negro, but are very much lower in the scale. See A. B. Meyer, *Über die Negriten oder Aëtas der Philippinen*, 1878; E. Tyson, *Essay concerning the Pygmies of the Ancients*, 1894; A. H. Keane, *Man, Past and Present*, 1900; W. Junker, *Travels in Africa*, 1900-2; H. Spencer, *Descriptive Sociology*, 1925; I. H. Evans, *Negritos of Malaya*, 1937; P. Schebesta, *Revisiting my Pygmy Hosts*, 1937.

Negro, Bush, see MAROONS.

Negro, Río: 1. Riv. of Argentina formed by the union of the Limay and Neuquén R.s., which rise in lakes in the Andes. It flows E. and SE., and after a course of 400 m. enters the Atlantic, 20 m. SE. of Viedma. Source of electric power.

2. Riv. of S. America, rising in Colombia, under the name Guainia. It flows E. and S., joining the Amazon as a trib. below Manaus. It is joined by the famous Casigniare Canal to the Orinoco system of Venezuela. It is navigable for steamers about 450 m.; for canoes 680 m. Total length about 1400 m.; breadth 1½ to 15 m.

Negro-African Languages. The African natives speak very many different languages and dialects, whose relationship has, as yet, not been estab. Nor is the exact number of the languages certain, as it is not always easy to distinguish between language and dialect. Various estimates ranging from 500 to 1000 have been made, but a great majority of them are confined to quite small tribes, and only about 350 have been written down. Besides, migration has produced mixed languages and dialects which cannot be easily classified. Finally, a few languages

may be considered a kind of lingua franca: they are understood over wide areas and serve as a common language between groups belonging to different linguistic families. Such are Hausa in W. Africa, Swahili in E. Africa, and Yoruba and Ybo in Nigeria. However, for convenience we can classify the African native languages into 5 linguistic families. One of them, extending in broad lines to the N. and E. of the Sahara, forms a great part of the Semitic-Hamitic family (see SEMITIC-HAMITIC LANGUAGES). The following are the other 4:

*Bushmen and Hottentots.* Their languages are of a most primitive form, primarily monosyllabic, and characterised by a curious 'click' prefixed to most of their words. It gives their speech a staccato sound.

*Bantu.* According to Sir Harry H. Johnston, there are to-day 226 distinct Bantu languages spoken over nearly the whole of the S. third of Africa, and constituting a very distinct type of speech. Contrasted with others among the groups of Negro tongues, 'it is remarkable as a rule for the Italian melodiousness, simplicity, and frequency of its vowel sounds, and the comparative ease with which its exemplars can be acquired and spoken by Europeans.' The Nyanja dialects, which employ Rom. characters, are spoken by over 1,500,000 people, and are the most interesting group of this linguistic family. They are mainly spoken in the Nyasa Protectorate, lying between Lake Nyasa, N. Rhodesia, Tanganyika Ter., and Portuguese E. Africa. The most important Bantu language is Swahili, mainly spoken in Zanzibar; it employs the Arabic alphabet and has become a kind of lingua franca in E. Africa.

The Bantu and the Sudanese (see below) languages are remarkable for the fact that they are prefix-prenominal tongues; that is, they employ prefixes instead of suffixes to indicate tense, declension, and so forth, to an extent unparalleled in any other linguistic family. These prefixes, constituting the concord class, recur in exact agreement in the subject noun, and in the other members of the sentence, i.e. in the adjectives, verbs, verbal objectives, and all the other qualifications. In other words, the prefix of the first word of the sentence (that is, the basic nominal concept) must also be the prefix of all the other words of this sentence, thus producing an alliteration similar to but much more monotonous than that of old Eng. poetry. Another important characteristic of Bantu and Sudanese is that the conjugation of verbs shows aspects of action rather than the time-relations as in Indo-European languages. Thus it shows completeness, emphasis, continuity, negation, and other relations, but not very many temporal ones. There is a certain parallel to this in Semitic languages.

*Sudanic, or Sudanese, or Sudanese-Guinean.* Languages belonging to this linguistic family are spoken mainly in the area between the Sahara and the equator, from the upper Nile to the Gambia and Senegal. There is a great mass of what



are rather dialects than languages, and the interrelations of these forms of speech, and their relations with the Bantu languages and other tongues of the African continent, are very obscure.

The Yoruba, a higher-grade and commercially minded people, numbering about 3,000,000, inhabit the SW. corner of Nigeria from the sea to Jebba and from Dahomey to the borders of the Bini state. Nago of the Dahomey coast region, and the Bini tongue, seem to be related to Yoruba. Ybo, spoken in E. Nigeria, ranks as another chief language of Nigeria. Twi (originally Kwi or Ekwi or Okwi), also known as Oji, Odshi, Tyi, Chwee, Tshi, Amina, Ashanti, etc., is another 'typical' Sudanic language. It is spoken by over 1,000,000 people living in the Ghana state and in part of the Fr. colony of the Ivory Coast. Like most African languages it is divided into a number of dialects, the most important of them being Akwapem, Asante, Akyem. The Twi group of languages and the closely related Fante tongue belong to the Akan linguistic group. Efik, another interesting Sudanese language, is spoken by some 50,000 people in Calabar, Nigeria. Yoruba, Twi, and Efik were reduced to writing over a cent. ago. Mandingo, Kru, and Kpwezi represent the 3 main types of Nigeria. There are many other languages and dialects belonging to this linguistic family, but the majority of them, though important from the linguistic or anthropological points of view, have no great importance for practical purposes.

It has not yet been estab. whether the Bantu and the Sudanese languages actually form distinct families or should be considered as subfamilies of one family. While they have common characteristics of grammatical structure (see above), their phonology and vocabularies are quite distinct.

*Nilotic languages.* This group also offers many problems, especially with regard to its relationship with the Hamitic Cushitic tongues (see SEMITIC-HAMITIC LANGUAGES). Mention may be made of some of the Nilotic-speaking tribes, such as the Nuer, living S. of the Sudan, in the flat country watered by the White and Blue Niles (N.E. Africa), and the allied peoples Dinka and Shilluk, also living in the upper Nile region. The important people the Masai (E. Africa and E. Central Africa), and some other tribes, are regarded as representing a fusion of Hamites with Nilotic Negroes. The Ba Hima and Wa Tusi tribes (Uganda-Karagwe-Urindi) are considered a mixed Hamitic-Bantu people.

See also, LANGUAGES, CLASSIFICATION OF.

*Bibliography:* see LINGUISTIC FAMILIES.

Negro Art, see NEGROES.

Negro Lethargy, see SLEEPING SICKNESS.

Negro Spirituals, Afro-Amer. religious songs, so named in the time of the civil war, though slavery is seldom mentioned in the songs and there is no spirit of vindictiveness in their words. The spirit of the Negro spiritual is informed by a docile melancholy, a patient yearning, and

a naïve confidence in the glory awaiting the singer in the next world. God, Jesus, Satan, and the great figures of the O.T. and the N.T. are dramatised in many N. S. Sometimes marching enters into Negro religious services, coupled with noisy religious exercises—a legacy, it is supposed, of the early Methodist revival meetings of the white masters. From a literary standpoint the words of Negro songs are mostly crude; picturesque and expressive phrases may occur, but their metrical arrangement is primitive, though the singers soon learn how to keep time and rhythm (see, for example, W. Jekyll, *Jamaica Song and Story*, 1907). As may be inferred from the origin of N. S. no less than from the gay and carefree character of the Negro, the emotional part is out of all proportion to the intellectual in the songs. This no doubt explains why the attempt to replace N. S. by the standard hymns of the white man's churches has, generally speaking, failed, except in the northern states and with the more educ. and sophisticated congregations of the cities. See also JAZZ and RAGTIME.

Negroes form one of the 4 great classes of the human race. In their purest form they are probably found along the Guinea coast, in the Gaboon, the basins of the Shari and Benue, and the lower Zambesi; but the Sudan is considered the home of the race. The term is now generally restricted to the S. or African branch, those of the E. region, of S. India, Malaya, New Guinea, etc., being Papuans or Melanesians. The former present various mixed types owing to Caucasian migration. The Negro characteristics are deep brown, almost black, skin, cool and velvety; short, black, woolly hair of elliptical section; short, flat, broad, snub nose with depressed base and dilated nostrils; black eye, black iris, and yellow sclerotic coat; prognathic jaws, facial angle 70°; thick lips, protruding and showing the inner red; high and prominent cheek bones; very thick skull, dolichocephalic (index 70°); cranial capacity, 35 (average European, 45); long arms; flat, broad foot with low instep, and 'lark heel'; yellowish palms and soles; height (average 5 ft 10 in.) above the average. A marked feature is the early closing of the cranial sutures.

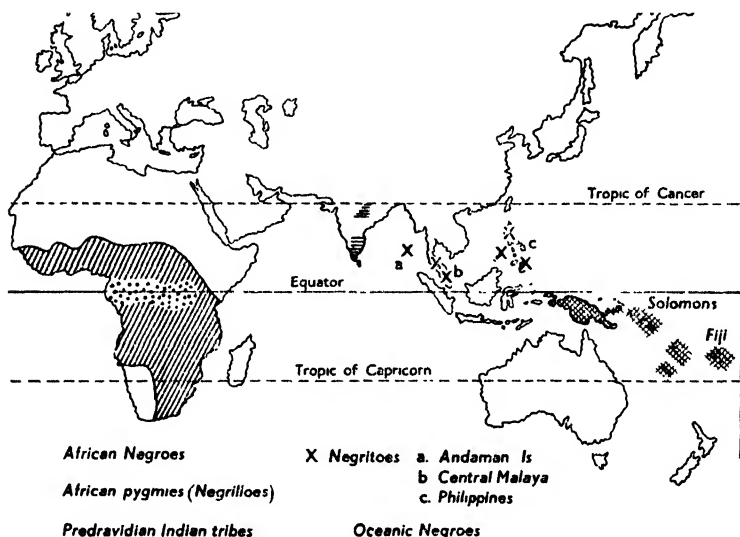
The Negro races in Africa comprise the true Negroes of W. Africa, the Nilotes and Nilo-Hamites of E. Africa, and the Bantu of E., Central, and S. Africa. The Bushmen, and the Semitic and Hamitic peoples of N. Africa, are not Negroes.

There are wide variations among Negroes, due to differences of climate and effects of migration and intermixture with Hamites and others. The African Negroes show every type of social development from simple tribal societies to great states of sev. million people (Buganda, Ashanti, Dahomey). In some of these societies descent is by patriline, in others by matriline, or both lines of descent may be recognised together. Polygamy is usually the ideal form of marriage, marriage being solemnised by the transfer of bridewealth. Negro religions are mainly cults of the dead or of spirits, but

most Negro tribes have a belief in a High God also. Beliefs in witchcraft, sorcery, magic, and fetishes are widespread. Slavery, by Arabs in the E. and Europeans in the W., has impoverished Negro Africa, many millions of its inhab. having being removed. To-day there are estimated to be 300 million Negroes in Africa alone.

The Negroes of Oceania and Melanesia are the inhab. of New Guinea and neighbouring is. They form small simple societies, in most cases without elaborate social organisation.

reached the New World, sev. d. in the 'Middle Passage.' Most New World slaves came from W. Africa, Congo, and Angola. Their descendants often still maintain certain tribal words and beliefs. To-day they are very intermixed with whites and other stocks, although in some areas (Haiti and Surinam) they have kept much to themselves and preserved many African customs. Their culture to-day depends largely on white influence, e.g. Portuguese Catholic in Brazil, Fr. Catholic in Haiti, Louisiana, and the Fr. Caribbean,



*With acknowledgments to N. A. Barnicot*

#### GEOGRAPHICAL DISTRIBUTION OF INDIGENOUS NEGROES AND SIMILAR PEOPLES

Pygmies may be counted among the Negroes, the African pygmies being Negrilloes and the Melanesian pygmies Negritos.

The Negroes in the New World are the descendants of slaves brought from Africa by the European powers. There were slaves in the mines of Hispaniola by 1500, and they were brought to what is now U.S.A. in 1619. Early slaves were used in mines and on plantations, mostly sugar, and in domestic service. The trade declined towards the end of the 18th cent., but the invention of the cotton gin and demand for cotton stimulated it anew, and the trade continued until the 1860's, illegally in U.S.A. after 1808 when the constitution prohibited slavery. Total figures taken from Africa are unknown, but it is estimated that between 1666 and 1766 alone 3 million were taken, and over 2½ million entered U.S.A. alone from 1808 to 1860. For every one who

Brit. Protestant in the Brit. Is. and U.S.A. Everywhere there has been white intermixture through marriage and concubinage: in U.S.A. it is estimated that only 25 per cent are still pure Negro. There are some 15 million Negroes in U.S.A. to-day, defined as people with Negro ancestry; elsewhere in the New World numbers are not known since 'colour' is there defined socially only and censuses do not distinguish white from Negro, mulatto, etc.

In early days in U.S.A. Negroes worked on plantations, mainly cotton, in the S. states. Slavery was abolished in various states at different dates, until the civil war, after which it was abolished for the whole U.S.A. by the 13th Amendment to the constitution. During the reconstruction period in the S. states, 'carpet-baggers' from the N. (see KU KLUX KLAN) led the ex-slaves to the polls, and for a period almost all the S. states were ruled

by Negro legislatures made up for the most part of illiterates. With the withdrawal of federal troops, the whites turned the tables and secured control of all the political machinery of the commonwealths. By various state laws the Negroes were practically disfranchised, despite the plain reading of the amendments to the federal constitution. In some states property and educational qualifications were invoked. In others there was the 'grandfather clause,' whereby anybody whose ancestors had the vote in 1867 continued to have it. To this day in the real S. the Negroes are largely disfranchised, although they have the full right of the ballot in the border states like Missouri, Maryland, and Kentucky.

The story of the Negro in the S. is a long one of a humble but determined struggle to rise in the scale. By the various 'Jim Crow' laws the Negroes are given inferior facilities in transport, education, and welfare generally. Since the decline of the cotton industry due to the boll weevil, the mechanisation of cotton farming, and the industrialisation of the S., a good proportion of Negroes have moved from rural areas. Those who remain are hired labourers or sharecroppers who share their crops with white landowners. The First World War wrought a profound change in the Negro question. The N. as well as the S. was now confronted with it. With immigration into the U.S.A. stopped by the war, the great industrial plants of the N. were in serious need of more labourers, and the S. states were canvassed by agents, who induced Negroes by thousands to move N., where there were good jobs, high wages, the vote, and no colour discrimination in the public schools. The Negro pop. of cities like Chicago, Akron, and others was increased to a great extent. New York became the greatest Negro city in the world. In the Harlem dist. of New York city there are about 400,000 Negroes of all classes. The Second World War accelerated the process, and Negroes have entered certain industries in large numbers, especially meat, steel, motor car, and entertainment. There are also many Negro professional men throughout U.S.A.

But with all the drawbacks, N. and S., with all the dark chapters of lynchings and riots, the Negro race has made marvellous progress since the civil war. To-day there are about 950,000 Negro farmers in the U.S.A. The majority of these are, of course, in the S.: Georgia, S. Carolina, and Alabama. The thirst for education among the Negroes has grown immensely. The individual states of the S. have done much to foster this, and wealthy Negro people have endowed many schools. In the N. and W. states (where there were, at the last census, 2,750,000 Negroes, or 20 per cent of the pop.) there is practically no separation of schools for Negro and white youth. In the 18 S. states and the dist. of Columbia the children of 9,500,000 Negroes, or 80 per cent of the pop., attended separate schools until the state segregation laws were decreed illegal by the Supreme Court

in 1955. There are to-day over 42,000 Negro churches, with upwards of 5,250,000 members and property worth \$200,000,000. The Negroes are mainly Baptists, Methodists, and Presbyterians and there are many independent separatist churches.

*Negro art, literature, etc.* It is in sculpture that the most important contribution of primitive Negro art has been made. Negro sculpture exhibits great plastic freedom, showing that the artist was capable of feeling in 3 dimensions, whereas much European sculpture shows a two-dimensional limitation. In Europe the influence of Negro art has been considerable: the example of Epstein and Picasso may be cited. For song and dance the Negroes have a natural aptitude, and have set the example for much modern syncopated music and the styles of ballroom dancing, not only in America but also in Europe.

Apart from the prevalence of Negro jazz in white civilisation, Negro songs and spirituals have had a lasting popularity. Negro singers such as Roland Hayes, Marian Anderson, and Paul Robeson have won for the Negro a high place in that art; and the Negroes' musical ability has also shown itself in gifted compositions by Wm. C. Handy, Wm. Grant Still, and others.

Literature among Afro-Amer. writers is often mystical, or is directed towards the social betterment of the Negroes. The Negro as subject was not overlooked by the white writers, particularly those of the S., such as Joel Chandler Harris and Thomas Nelson Page. A bold treatment of the Amer. Negro was given dramatically in *The Nigger* by Edward Sheldon (1909), and the one-act plays of Ridgely Torrence (*Granny Maume*, *The Rider of Dreams*, and *Simon the Cyrenian*, 1917) are also concerned with the Negro, while the controversial play, *Green Pastures*, may be mentioned, and the novel, *Lanny*, by du Bose Heyward. But the most significant development has been the creation of literature by Negroes themselves, fully race conscious and impatient of the old sentimental and humorous aspects. There are realists who objectively try to describe Negro life, as they alone can know it, with full details of dialect, superstition, and religious ecstasy. There are the symbolists, more concerned to express the real racial feeling buried deep in the Negro's soul. These men for the most part eschew dialect. They try to do in literary Eng. what Irish writers have done for their peasant folk. This is best illustrated in the various 'blues' by Langston Hughes and the versified Negro sermons written by James Weldon Johnson. In Claude McKay there is presented the defiant Negro poet who resents the slights and injuries put upon his race. Countee Cullen's *Black Christ*, dealing with a lynching, is famous among Amer. students of Negro poetry.

*West African indigenous art.* There is an individuality in W. African indigenous art and a genuine tradition that justify its special consideration. The aesthetic

aspect of African culture is a discovery of the present generation. The basis of African art was essentially religious, and its tradition in W. Africa is threatened by the crumbling of the religious and tribal systems under which it grew up. Educational reform may go far to check the evil influence of bad European models on indigenous arts; but it is evident that, if the ritualistic beliefs which dictated the forms of the older carvings are yielding to new conceptions of life and death, form and style will require careful and



British Museum

AN EXAMPLE OF NEGRO SCULPTURE  
Nimba mask, which is carried on the shoulders, and used by the Baga tribe of French Guinea.

sympathetic guidance. The monumental heads of Gabun, the bronzes of Benin, the masks of the Portuguese Congo, and the sculpture of the Ivory Coast all prove that in the sphere of art W. Africa is coherent and as a whole has regional unity in its plastic art. There are signs of external influences, as, for example, in the designs of the state chairs of the tribal chiefs of Ashanti, which betray a European influence, while some carvings in the Fr. Sudan show Nilotic traces; but, generally speaking, W. Africa has made its own characteristic contribution to the artistic creations of the world. Much that is implicit in the work, the meaning of its symbolism, the ancestral associations of its forms: much of all this is necessarily lost on the European observer, and indeed, belonging to a passing age, there is danger that soon they will hardly be understood by any but the older African generations. The outstanding achievements in the sculpture include

masks for ceremonial use; the long-necked heads from Gabun; red terra-cotta heads of Ifé, Nigeria; the heads of the Baluba from the Belgian Congo and Manyema in the Fr. Congo; and the bronze heads from Benin.

See M. N. Work, *Bibliography of the Negro*, 1928; A. Davis and B. B. and M. R. Gardner, *Deep South*, 1937; E. F. Frazier, *The Negro Family in the United States*, 1939; C. G. Seligman, *Races of Africa*, 1939; A. Davis and J. Dollard, *Children of Bondage*, 1940; M. Herskovits, *The Myth of the Negro Past*, 1941, and *Trinidad Village*, 1947; J. H. Lewis, *The Biology of the Negro*, 1942; D. Pierson, *Negroes in Brazil*, 1943; G. Myrdal, *An American Dilemma*, 1944; St. C. Drake and H. R. Cayton, *Black Metropolis*, 1946; A. Rose, *The Negro in America*, 1948; W. L. Warner, *Structure of American Life*, 1952; F. Henriques, *Family and Colour in Jamaica*, 1953. NEGRO ART: F. von Luschan, *Die Altertümer von Benin* (3 vols.), 1919; C. Einstein, *Negerplastik*, 1920, and *Afrikanische Plastik*, 1925; P. Guillaume and T. Munro, *Primitive Negro Sculpture*, 1926; E. von Sydow, *Handbuch der westafrikanischen Plastik*, 1930; K. Kjerfve, *Centres de style de la sculpture nègre africaine* (4 vols.), 1935-8; J. J. Sweeney, *African Negro Art*, 1935; L. Underwood, *Figures in Wood of West Africa*, 1947, *Masks of West Africa*, 1948, and *Bronzes of West Africa*, 1949; M. Griaule, *Arts of the African Native*, 1950; P. S. Wingert, *Sculpture of Negro Africa*, 1950; P. Dark, *Bush Negro Art*, 1954; M. Trowell, *Classical African Sculpture*, 1954; D. Paulme, *Les Sculptures de l'Afrique noire*, 1956.

Negros (formerly Buglas), is. of the SW. Visayas group, Philippines, between Cebu (SE.) and Panay (NW.), with the active volcano, Mt. Malaspina or Canlaón (8088 ft.). The mt. ridge forms a continuation of Mindanao (Dapitan). Sugar cane, coffee, tobacco, and rice are produced. Bacolod and Dumaguete, caps. of the occidental and oriental provs., are the chief tns. Area 4905 sq. m.; pop. 1,218,700.

Naguib, Mohammed (1901- ), Egyptian soldier and politician, b. Khartoum. He was educ. at Gordon College, Khartoum, the Military Academy, Cairo, and Cairo Univ. He rose to high rank in the army, served in the war against Israel, 1948, and was one of the leaders of the *coup d'état* which deposed King Farouk, 1952. He became commander-in-chief of the army and military governor of Egypt, and in June 1953 became President of the Egyptian Rep. He was ousted from power by Nasser (q.v.) in Dec. 1954, and subsequently retired completely from public life.

Negús, title of a king or ruler in Ethiopia, the emperor being *N. nagast* (king of kings). In the last two cents. the rulers of Amhara have claimed it.

Negus, mulled port, once a popular drink. Nehemiah. The book of N. is closely connected with that of Ezra (q.v.), and in the Jewish canon the two form a single book under the name of Ezra. It tells

how N., cup-bearer to Artaxerxes, learnt of the condition of Jerusalem, obtained leave to visit it, and set about its restoration; and of the actions of Ezra in restoring the observance of the law. See L. E. Brown, *Early Judaism*, 1920.

**Nehru, Jawaharlal** (1889-), Prime Minister of India since independence in 1947. N. was b. Allahabad, India, of Kashmiri Brahman stock, and is frequently called Pandit N., the term signifying his Kashmiri descent. N. himself objects to its use. Son of Motilal N. (q.v.), he was educ. in England at Harrow and Trinity



*The High Commission of India*  
PANDIT NEHRU

College, Cambridge. He became a barrister of the Inner Temple, and practised law at Allahabad. He rapidly established his political position as a fervent nationalist, and in 1918 became secretary of the Indian Home Rule League and a member of the All India Congress Committee. He became general secretary of the latter in 1929, and president of the Indian National Congress, 1929-30. He became president again in 1936-7.

Throughout his political career until independence was achieved N. displayed the most determined nationalism and tended to the more extreme exhibitions of it against the Brit. Gov., spending in all 13 years in prison for illegal and subversive activities. Yet, impatient as he was of all delay, his great admiration and respect for Mahatma Gandhi (q.v.), with whom his reasoning could not always agree, restrained him from excess. Though much of his life has been spent in bitter and determined opposition to the Brit. Gov., he has never been anti-British, and has a sincere appreciation of Britain and W. thought and culture, and their contribution to development in India. As Prime Minister he remains probably the most sturdy supporter in India of the Commonwealth connection.

Since independence he has been foreign minister as well as Prime Minister. It has been his continuing aim to develop India industrially, economically, and socially at the greatest possible speed, and for that purpose he has determined to avoid entanglement in international disputes; his logical conviction that war provides no solution is as strong as his humanitarian loathing of war as such. As leader of the second largest Asian country in a world tending to divide itself into two irreconcilable blocs, it is not surprising therefore that his reactions to specific international problems have often given rise to puzzlement and misunderstanding in one bloc or the other. This fact, however, has not caused him to waver in any degree from his objective or his course.

N. would not claim to be an exceptional administrator; in that aspect of gov. he suffered a great loss in the death of his life-long colleague Sardar Vallabhbhai Patel (q.v.). Yet since the murder of Mahatma Gandhi (q.v.) in 1948, N. has held an unrivalled sway over the people of India, and his voice is the authentic voice of India as a whole. During his years in prison under the Brit. Gov., N. devoted much time to reading and writing. His best known works are *Autobiography*, 1936, 1942, *India and the World*, 1936, *Before and After Independence*, 1950, and *The Discovery of India*, new ed., 1956.

**Nehru, Motilal** (1861-1931), Indian Swarajist, father of Jawaharlal N. (q.v.). Advocate in high court at Allahabad, where he had a magnificent residence; in 1919 he turned his house into a free school which eventually became Congress H.Q. He founded the *Independent*, and presided over Congress, 1919 and 1928; supported non co-operation and was imprisoned. In 1923 he entered the Legislative Assembly and became president of Swaraj party, 1925. In 1928 he presided over the All Parties Conference at Bombay, which produced the N. report recommending dominion status. He endorsed Gandhi's civil disobedience in 1930 and was sentenced to 6 months' imprisonment. A man of great learning and culture, with a keen appreciation of the graces of life, he was a convinced nationalist, but hopeful that the substance of nationalist demand could be achieved by agreement with the Brit. Gov. Towards the end of his life that belief was shaken, but he retained a liberal outlook and an unflinching courtesy.

**Neile, Richard** (1562-1640), Archbishop of York, b. Westminster. Having taken his doctor's degree in divinity in 1600, he became in 1605 Dean of Westminster. In 1608 he was made Bishop of Rochester and appointed Laud his chaplain, and in 1610 was translated to Lichfield, removing to Lincoln, 1614, Durham, 1617, and Winchester, 1628. He was an uncompromising churchman, prominent in the party of which Laud (q.v.) became the leader. He sat regularly on the High Commission and in the Star Chamber, and in 1631 was made Archbishop of York.

**Neill, Alexander Sutherland** (1883- ), educationist, b. Forfar. After studying at Edinburgh Univ. he was successively office-boy, draper, teacher, and journalist. In 1921 he helped to found the International School, which was located in Germany, Austria, and then England. His unorthodox theories on education and child psychology are set out in *A Dominie's Log*, 1915, *A Dominie Dismissed*, 1916, *A Dominie in Doubt*, 1920, *A Dominie Abroad*, 1922, *A Dominie's Five*, 1924, *The Problem Child*, 1926, *The Problem Parent*, 1932, *The Problem Teacher*, 1939, *The Problem Family*, 1948, and other books.

**Neilson (Nelson-Terry), Julia** (1869-1957), actress, b. London. She studied music with success but abandoned it for the stage, playing Galatea to Lewis Waller's Pygmalion. She married Fred Terry, and appeared generally under Beerbohm Tree's management until Terry began management in 1900, after which she appeared with him. Her best-known parts include Nell Gwyn in *Sweet Nell of Old Drury*, Lady Blakeney in *The Scarlet Pimpernel*, and Rosalind in *As You Like It*. See her memoirs, *This for Remembrance*, 1940.

**Neilson, Lillian Adelaide** (c. 1848-80), assumed name of Elizabeth Ann Brown, also known as Lizzie Bland (Bland being her stepfather's name), actress. She made her debut at Margate (1865). Her most celebrated role was that of Juliet. She was popular also in America, appearing at Booth's Theatre, New York (1872).

**Neilston**, tn in Renfrewshire, Scotland, 10 m. SW. of Glasgow. Thread manuf. and bleaching are carried on. Pop. 5951.

**Neisse** (Polish Nysa), name of 2 tribes. of the Oder (q.v.): 1. The Silesian N. which rises near Kłodzko (q.v.), in Poland, and flows 120 m. NE. to enter the Oder 15 m. NW. of Opole (q.v.).

2. The Lusatian N., which rises in the region of Liberec (q.v.), in Czechoslovakia, and then forms the boundary between Poland and the dists. of Dresden and Kottbus (in the Ger. Democratic Rep.), joining the Oder S. of Fürstenberg (qq.v.). Length 140 m. Together with the Oder it has formed since 1946 the boundary between Germany and Poland.

**Neisse** (tn), see NYSA.

**Neihart, Matthias**, see GRÜNEWALD, MATTHIAS.

**Neiva**, tn of central Colombia, cap. of Huila dept. on the r. b. of the Magdalena, 75 m. from Girardot and 218 m. from Bogotá. It produces cattle and coffee, and its industries include the manuf. of Panama hats. It has good air, rail, and road connections. Pop. 41,284.

**Nejd**, or **Najd** (Arabic 'upland'), the plateau in N. Arabia which slopes from the W. mts to the Persian Gulf. Usage varies: the name may include the whole of N. Arabia E. of the mts or only that part S. of Jebel Shammar (q.v.). Some parts like Qasim and Washm have their own names. Taken in the larger sense the area is 800,000 sq. m. and the pop. 3,000,000. The greater part is desert, including the Nejd and Dahna, though

the sand provides grazing in the spring. In places oases are numerous, the beds of the wadis may be flooded, and in Aflaj there are even ponds, one of which may be called a lake. Riyadh (pop. 60,000) is the cap., and other tns are Boreida (30,000), Anaiza (25,000), Shaqra, and Hail. (These figures are estimates and may have to be increased by two-thirds.) Qatif and Uqair, ports on the Persian Gulf, are suitable only for the local sailing craft. The inhab. are mostly Bedouin who bred camels and, to a lesser extent, horses, but motor transport has damaged this trade severely. Dates and some cereals are grown for home consumption and small quantities of dates, hides, and ghee are exported. Such industry as there is supplies home needs. The whole economy of the country has been changed by the discovery of oil in the E. round about Dahrhan near the is. of Bahrain. A railway runs from the oilfields (Dammam) to Riyadh. Nejd was the scene of the original Wahhabi movement; the inhab. still hold that form of the Muslim faith and the King of Saudi Arabia belongs to the family which in the beginning supported Ibn Abd al-Wahhab. For the hist. see ARABIA and SA'UD, IBN.

**Nek** (or **Poort**), Afrikaans (q.v.) word in common use throughout S. Africa, meaning a mt pass.

**Nekrasov, Nikolay Alekseyevich** (1821-1877), Russian poet. His main theme is the suffering of the Russian lower classes, and he did much to draw the attention of educ. society to it. Chief poems: *Who Lives well in Russia?*, *The Railway*, *Peasant Children*, and *Russian Women*. He owned and conducted the radical monthlies *The Contemporary* (q.v.) and *The Notes of the Fatherland*.

**Nelson, Horatio, Viscount Nelson, Duke of Bronte**, in Sicily (1758-1805), admiral, fifth son of Edmund N., rector of Burnham Thorpe, Norfolk, was b. there 29 Sept. On his father's side he came of a family of clergymen; his grandfather was rector of Hilborough, as his father had been, and two of his brothers were clergymen, one, Wm N., after Horatio's death at Trafalgar, being gazetted Earl N. of Trafalgar, with remainder to the heirs male successively of his sisters, Mrs Bolton and Mrs Matcham. Of N.'s childhood little is known. He himself has written that he was at the grammar school at Norwich and afterwards at N. Walsingham, where a brick in the wall covered by glass is still pointed out, marked with the initials 'H. N.' On 17 Nov. 1770, Capt. Suckling, having been appointed to the command of the 64-gun ship *Raisonnable*, entered his nephew on 1 Jan. 1771 as a midshipman. Soon afterwards he went with his uncle to the *Triumph*, guardship of the Medway, in the rating of 'captain's servant,' this being a recognised practice to secure training as a naval cadet. Early in 1773 he was transferred at his own request to the *Carcass*, which was going on a voyage of discovery in the Arctic, an education of trial and hardship for a boy of 15. Later he was rated as a midshipman 'aged 18'

(a gross fiction to conceal irregularities) of the *Seahorse*, a frigate which was fitting out for the E. Indies. In this vessel he visited almost every part of the E. Indies, but under the trying climate his health gave way, and on 14 Mar. 1776 the commander ordered him to be discharged to the *Dolphin* for passage to England. N. himself said that the kindness of Capt. Pigot of the *Dolphin* saved his life and indeed he seems to have regained his health as soon as he reached England. Some days later he was appointed Lieutenant of the 64-gun ship



LORD NELSON

*Worcester*, by order of Sir James Douglas, commander-in-chief at Portsmouth, and, no doubt, through the interest of Capt. Suckling, who was now comptroller of the navy. Mark Robinson, captain of the *Worcester*, treated N. as an equal rather than a very young acting lieutenant, and some few years later in an action off the Chesapeake Robinson strongly influenced N.'s tactical studies.

Meanwhile, having passed the necessary examination at the navy office, he was promoted to be lieutenant of the *Lowestoft*, 10 April 1777, a 32-gun frigate fitting out for the Jamaica station. The *Lowestoft* had the good fortune to have for its captain Wm Locker, who had distinguished himself in the Seven Years War and afterwards joined Hawke's flagship, the *Royal George*; and the valuable lessons Locker had learned from Hawke he now passed on to N. There is no doubt of the great influence he had on N., whom he found avid of knowledge, zealous for the service, and restlessly energetic, qualities which won his heart as a sailor and as a man. In 1778 N. was moved on probation into Sir Peter Parker's flagship *Bristol*, but his probation did not last long, and on 8 Dec. 1778 he was promoted to be commander of a brig, and, 6 months later, to be captain of a Fr. prize renamed *Hinchinbroke*. In this vessel he led an expedition

against Grenada on the extremely unhealthy Lake Nicaragua, but was afterwards prostrated by malaria and apparently near to death when he was recalled to Jamaica by his appointment to the *Janus*, a 44-gun ship (being succeeded on the *Hinchinbroke* by Collingwood). After recuperating for some months in England he was appointed to command the *Albemarle*, a 28-gun frigate. He cruised for many months without any particular success, but gave satisfactory proof of his ability as an officer, and earned the approval of Lord Hood. He was placed on half-pay in 1783, but not long after was appointed to the *Borras*, and went to the W. Indies, where he captured 5 Amer. ships engaged in irregular trading, in defiance of the instructions of Sir Richard Hughes. Actions for illegal detention were brought against N., who had, perforce, to remain a prisoner on board his own ship. Eventually an order came out for N. to be defended at the cost of the Crown, and so, for the time, his share in the affair might seem to have ended, but for some years afterwards new writs were issued which, though always defended by the Crown, were a source of great annoyance to N.

In Mar. 1783 he sailed for St Kitts, being there for sev. months. Here he fell in love with a young widow, Frances Nisbet, niece of Herbert, president of Nevis, and daughter of Wm Woolward, a judge of the is. But contrary to the common assumption of a love match, the tone of his letter to Frances suggests esteem rather than passion. They were not married until Mar. 1787, Prince William, who had come out as captain of the *Pegasus*, giving the bride away. In the summer of 1788 N. went to Norfolk and made his home with his father at Burnham Thorpe, where he lived for a period of 4½ years, during which time his applications for employment met with no response beyond a formal acknowledgment, possibly because he was regarded as a man likely to give trouble in time of peace by excess of zeal, as witness the law-suits over the seized Amer. traders. At this time he was in straitened circumstances, for in addition to his uncle's allowance of £100 a year, he had only his half-pay of £120. It was not until a war with France was threatened in 1793 that he was given the command of the *Agamemnon*, in which in Aug. he conveyed troops to Naples, where he became acquainted with the Eng. minister, Sir Wm Hamilton, and his beautiful and notorious wife, Emma (q.v.). In the following year the commander-in-chief, Lord Hood, attacked Corsica, and gave N. the command of the landing party. N. was successful in the operations at Bastia and Calvi, but at the latter engagement lost the sight of one eye. N. gained valuable experience in this, his first real action against the French, off Genoa (1795) in which the *Agamemnon* was the Eng. ship most closely engaged. The memory of the action is notable for N.'s criticisms in his letters of Adm. Hotham's conduct of the battle, and posterity may

be justified in assuming that had N. been in command most of the Fr. ships would have been captured. He was promoted commodore in 1796, and in the following year, for his share in the victory off Cape St Vincent, was raised to the rank of rear-admiral.

He had waited 18 years for his flag rank but was still under 40. (Collingwood reached flag rank at 50, Howe at 45, St Vincent at 53, and Saumarez at 44.) In the same year in an engagement he lost his right arm. For his successful attack on the Fr. fleet in Aboukir Bay (1798) he was created Baron N. of the Nile. His attachment to Lady Hamilton was now very strong, and he was at Naples whenever he could possibly be there. What N. had never yet found in women Lady Hamilton gave him—admiration and appreciation, undisguised and unstinting; and, by the admission of even her unfriendly critics, in giving that admiration she lent reality and grace to the part she was playing.

After his return to England in company with the Hamiltons, a return necessitated by ill health, N. and his wife separated. In 1801 he was promoted vice-admiral, and was in command of the attack on Copenhagen, being raised to the dignity of a viscount for his services. At this famous battle N.'s flagship, the *Elephant*, commanded by Capt. Foley, who had distinguished himself at the battle of the Nile, was in the centre opposite the Dan. commodore Fischer's ship *Dannebrog*. As to the popular incident of the telescope and N.'s blind eye, it is well confirmed that Sir Hyde Parker, through Otway, his flag-captain, made it clear that the signal to discontinue the action should be understood as permissive and Foley also so understood it. But Col. Stewart (who told the story), who stood beside N. when he lifted his glass, was not aware of the tenor of Otway's message and failed to appreciate that N.'s action and words were jocular. He lived with the Hamiltons in London and at their country house, and after the death of Sir Wm in 1803 continued his intimacy with the widow. Lady Hamilton bore N. 2 children, both daughters, but the second *d.* soon after birth and N. never saw her. N. left it to her to buy the house at Merton, the only home they ever had in England, for he was unable to get leave from the Admiralty even for a few days. Here he spent his happiest hours and from here he set out to fight his last battle.

In May 1803 N. was appointed to the command of the Mediterranean fleet, and made the *Victory* his flagship. He lay off Toulon in the hope of the Fr. fleet coming into the open, and so being able to engage it. Napoleon's plan was for the Fr. and Sp. fleets to meet in the W. Indies and there combine into an overwhelming force. Villeneuve, now in command of the Fr. fleet at Toulon, managed to evade N., but a storm drove him back to the shelter of the forts; but later he was able to get away, while N. was delayed at Maddelena by contrary

winds. He eventually, on 21 Oct., engaged the allied fleets off Trafalgar, and shortly before the action began hoisted from the flagship the famous signal,

England expects that every man will do his duty.' It may be noted here that Adm. Mahan and most authorities state that it had been laid down by N. in his memorandum of 9 Oct., that if the Eng. fleet should be to the windward of the enemy, it would be his object to bring it, in 3 lines, parallel to and within gunshot of the enemy, from which position the lee line of ships would bear up all together and attack the enemy's rear, while the weather line and advance squadron threatened the van until such time as it became expedient for them too to bear up and attack the enemy's centre. But the lightness of the wind made it impossible to manœuvre into the requisite position without risking the loss of a whole day and of the opportunity to attack at all. N., however, had no doubt foreseen and discussed the contingency, so that the modification of his plan, which was apparent, was no doubt at once understood by his subordinates. Ideally the Eng. fleet was in 2 lines perpendicular to the Allies' single line, but in fact the lines on both sides were very irregular, and on the part of the English were rather elongated clusters. This modification of the plan did not, however, affect the essential part of it, and as Mahan writes: 'It is not to the discredit but greatly to the credit of his conception, that it was susceptible of large modification in practice while retaining its characteristic idea.' The victory was complete and decisive, but, when the fate of the action was determined, N. was shot down on his quarter-deck, and *d.* a few hours later.

His last words were: 'Thank God I have done my duty.' His body was brought home, and, after lying in state at Greenwich, was publicly buried in St Paul's Cathedral on 6 Jan. 1806. There are many memorials to him, the most notable being the lofty monument in Trafalgar Square, London. He was one of the greatest, if not the greatest, of Brit. naval commanders, and his bravery and skill were beyond all question. The Commons liberally endowed the title, which, as said above, passed to Wm N., gave £15,000 to each of the sisters, and £200 a year for life to Lady N. upon whom N. had settled £1200 a year when they separated. A N. annuity of £5000 a year was paid by the State from 1806 until 1946, when the gov. introduced a Bill (entitled the Trafalgar Estates Bill) to terminate it on the death of the then earl or his heir. On N.'s character it is agreed that at 21 he had charm of manner which reflected a kind and generous nature. There is abundant evidence that N. frequently displayed the self-assertive vanity of a boy, with all a child's love of praise, and a woman's love of flattery, which Lady Hamilton knew how to give. But that he could also act as an officer, judge, and statesman we know from the record of his life and on the evidence of the Duke of Wellington (who once, and only



once, met N., at the Colonial Office in Whitehall). He was of delicate health and diminutive figure, which gave no external hint of his intellectual powers or of the eagerness for glory, or rather honour, which he possessed from his earliest years as a midshipman.

**Bibliography.** There are many biographies. The most popular was for long that by Robert Southey (1813). The voluminous *Life* by Clarke and McArthur (2 vols.), 1808, has been the foundation of most later lives, but should be read with considerable reserve on account of the uncritical attitude of the authors; many of its anecdotes are mere sailors' yarns resting on doubtful authority. Capt. A. T. Mahan's *Life of Nelson: the Embodiment of the Sea Power of Great Britain* (2nd ed.), 1899, is valuable for its handling of naval technique. The prin. authority for N.'s private life is *The Hamilton-Nelson Papers* (2 vols.), 1894, which were privately printed; many of these have been used in J. C. Jeaffreson's *Lady Hamilton and Lord Nelson* (2 vols.), 1888, and *The Queen of Naples and Lord Nelson* (2 vols.), 1889. The best short life is John Knox Laughton's *Nelson*, 1905, which contains an excellent historical background. The prin. authorities for N.'s professional life are his dispatches and letters, which were ed. by Sir Nicolas Harris Nicolas (7 vols.), 1844-6; James's *Naval History*; the official correspondence of Adms. Hood, St Vincent, and others (now in the Public Record Office), and E. Chevalier, *Histoire de la marine française sous le Consulat et l'Empire*, 1886. See also G. A. Stephen, *Horatio, Viscount Nelson*—a catalogue of books, pamphlets, articles, and engravings relating to Nelson in the Norwich Public Library, 1915; C. Wilkinson, *Nelson*, 1931; R. Capes, *Poseidon: a Personal Study of Admiral Lord Nelson*, 1947; the authoritative and excellent life by Carola Oman, 1947; G. Rawson, *Letters from Lord Nelson*, 1949; O. Warner, *A Portrait of Lord Nelson*, 1958.

**Nelson, Thomas** (1780-1861), son of a Stirlingshire farmer, first pub. popular reprints of religious works from his second-hand bookshop in Edinburgh in 1798. The firm of N. which he founded were pioneers in the use of the rotary press (shown at the 1851 Exhibition) and of half-tone blocks, for which they developed a new type of surfaced paper. In 1854 they opened a New York office, to be followed by branches in Toronto, Paris, Melbourne, and Johannesburg.

**Nelson:** 1. Mun. bor. of Lancs, England, 3½ m. N. of Burnley, granted its Charter of Incorporation in 1890. It is one of Lancs's prin. cotton tns, the home also of iron foundries, brick yards, confectionary manuf., surgical appliances, and other industries. The council owns the water undertaking, covered market, public library, cemetery, public baths, an open-air swimming pool in Marsden Park, civic restaurants, sewage and refuse disposal works, and 3 recreation parks. Pop. 34,384.

2. Prov. dist. of the S. Is. of New

Zealand. There are many mineral deposits awaiting development; dolomite, feldspathic clay, cement, marble, and limestone are produced. The prov., particularly the N. portion, is best known for its fruit, tobacco, and hops. Apples are the main crop with pears next, though peaches, plums, cherries, and small fruits, including raspberries, currants, etc., are produced in abundance. In 1948 the apple and pear crop reached 1,250,000 bushels. There is a large canning factory in Nelson city and a modern state fruit-processing plant in Motueka, which is a centre of the fruit industry about 35 m. from Nelson city. Nelson is the only dist. in New Zealand where tobacco is grown, commercially, and in 1947 more than 4300 ac. were planted and over 5,000,000 pounds of leaf produced. From the Kent hopfields more than a cent. ago early settlers brought hop sets which flourished in the dist., where the industry has continued ever since. It is the only dist. in New Zealand in which hops are grown, and from it the commercial needs of the dominion are supplied. The ann. yield is about 3300 bales. Tomatoes, grown mainly in and around Nelson city, have developed into a major industry which is supplying the markets in many centres throughout the dominion. In 1947 the crop value was about £220,000, 22 ac. being grown under glass. Another big industry is that of timber production. The prov. probably has the largest area of standing native bush in New Zealand. Milling of the timber is extensive, but reliance is being placed more and more on exotics. Some 50,000 ac. have been planted, mainly in the state plantation, and there are in addition 25,000 ac. of privately owned plantations. Milling of this timber is proceeding. The cap., Nelson city, up to the date of the abolition of prov. gov., was the seat of the Nelson Prov. Council. In 1858, by letters patent, Queen Victoria constituted Nelson a bishop's see and a cathedral is in course of construction. Nelson was founded in 1842 under the direction of the New Zealand Co., and was the third of the settlements estab. by Edward Gibbon Wakefield's famous company. Its institutions include one of the oldest secondary schools in the dominion. Nelson College (for boys) was founded in 1856 and has a roll of over 700 of whom nearly 300 are boarders from other parts of New Zealand and even from abroad. Nelson Girls' College, under the same board of governors, has a roll of over 500 of whom nearly 100 are boarders. Another of Nelson's notable institutions is the Cawthron Institute, which is well known throughout New Zealand and the scientific world for its valuable work on soils, mineral deficiencies, and the control of fungus and insect pests. The institute owes its origin to Thomas Cawthron, an old Nelson resident, who left practically the whole of his fortune, amounting to £240,000, for the promotion of scientific research in its application to the primary industries of New Zealand. In its work the institute has the co-operation of the

gov. dept of scientific and industrial research. Nelson is the chief port of the prov., having a good harbour capable of berthing ships 550 ft long and drawing up to 22 ft. Area of prov. 10,870 sq. m.; pop. 70,825. Pop. of Nelson city, 22,519.

3. City in the S.E. of Brit. Columbia, Canada. It stands on the W. arm of the Kootenay Lake, and is the chief tn of the silver-mining dist. of W. Kootenay. The tn was incorporated in 1897, and has fine schools, churches, etc.; there are saw-mills, marble and veneer works; granite is quarried and jam is manuf. Nelson is a tourist resort. Pop. 7117.



NELUMBO: LOTUS

**Nelumbo** (synonym **Nelumbium**), genus of 2 species of aquatic plants, family **Nymphaeaceae**. *N. lutea* is the Amer. Lotus; *N. nucifera* the E. Indian Lotus, with large, fragrant, white, tinted flowers, sacred to many peoples of the E. in India and China. Hindus believe that the whole universe rests on a Lotus blossom. It is a symbol of beauty, purity, the sun, and of life. The Sacred Lotus of Egypt was probably *Nymphaea lotus*.

**Nematodes**, **Nematoda**, **Threadworms**, or **Round-worms**, order of unsegmented round-worms with a mouth, a swollen gullet, and a digestive canal running the whole length of the body. They vary in size from *Eustrongylus gigas*, of which the female exceeds a yard in length, to the very minute *Heterodera*s, parasitic on plants and less than  $\frac{1}{16}$  of an in. In some N., notably the Strongyle, which causes 'gapes' in chickens, the male is attached to the female, the whole resembling in form the letter Y. A large proportion of N. are parasitic in animals, including man. *Trichina spiralis* enters the human system from badly cooked pork, and millions of the worms of this species have been found in the body of a man. Many N. are the causes of very heavy losses amongst domesticated animals. Apart from intestinal N., one of the most serious parasites is *Strongylus micrurus*, which causes verminous bronchitis ('husk' or 'hoose') in calves that

are put out during the autumn months on wet pastures. This and many other parasitic worms are checked or eradicated by the presence of salt in the soil. One of the most serious plant parasites is *Heterodera radicicola*, which causes root knot disease in tomatoes and cucumbers. *Ascaris lumbricoides* is a common parasite in pigs and man. See also ANKYLOSTOMIASIS; ASCARIS; FILARIASIS; PARASITES; TRICHINOSIS. See W. Yorke and P. A. Maplestone, *The Nematode Parasites of Vertebrates*, 1926; B. G. and M. B. Chitwood, *An Introduction to Nematology*, 1937; T. Goodey, J. B. Goodey, and M. T. Frankling, *Nematode Parasites of Plants Catalogued under their Hosts*, 1956.

**Nematus**, see SAW-FLIES.

**Nemausus**, see NIMES.

**Němcová, Božena** (1820-62), the first eminent Czech woman writer. She began by writing patriotic poems, and went on to stories which she claimed to be folk-tales but which were actually her own invention. She used a folk motif, but added her own feelings and experiences (e.g. *Národní báchorky a pověsti*, 1845-1847). Many striking female characters appear in her stories. *Babička* is her best-known work (Eng. trans. *The Grandmother*, 1891). It is a vil. novel, full of idealised reminiscence, in which the ann. round of country life is described. Her later works show more interest in social reform, especially as regards the position of women.

**Nemea**, anct site in Argolis (q.v.), with a grove and temple of Zeus. It was the scene of the Nemean Games (q.v.), and of Heracles' legendary killing of the Nemean Lion.

**Nemean Games**, one of the 4 great athletic festivals of Greece, held at Nemea biennially from 516 bc. The records mention all the usual contests (running, wrestling, boxing, etc.), excepting the chariot race. The N. G. were celebrated under the presidency of Cleonae, Argos, and Corinth in turn; the prize was a wreath of wild parsley; and many of the victors are commemorated in the *Nemean Odes* of Pindar (q.v.). See E. N. Gardiner, *Greek Athletic Sports and Festivals*, 1910.

**Němeký Brod**, see HAVLÍČKŮV BROD.

**Nemertea**, subdivision of unsegmented worms allied to, and by some authorities, arranged among, Platyhelminthes, the flat-worms. They are long, ribbon-shaped animals. Most of them are marine, but a few occur in fresh water and a few also on land. It is doubtful whether any are true parasites.

**Nemesia**, genus of about 50 S. African ann. or perennial herbs, family Scrophulariaceae, of which *N. strumosa* and its varieties are popular garden half-hardy flowers.

**Nemesianus**, **Marous Aurelius Olympius** (fl. late 3rd cent. AD), Rom. poet. b. Carthage. He wrote poems on hunting, *De Venatione* and *Cymegetica*; on fishing, *Halientica*; and on aquatics, *Nautica*. There is an ed. with trans. in J. W. and A. M. Duff's *Minor Latin Poets* (Loeb Library), 1934.

**Nemesis** (Gk, 'retribution'), daughter

of night, and goddess of vengeance and chastisement, also called Adrastela, 'she whom none can escape.' She personifies indignation at all disturbance of proportion, punishes the arrogance (*hybris*) that accompanies good fortune, and brings things again within normal bounds.

**Nemesius** (fl. c. AD 390), Christian philosopher, was Bishop of Emesa in Syria. Very little is known about the facts and dates of his life. He is chiefly remembered as the author of *Peri phuseōs anthrōpou* (On Human Nature), a treatise on anthropology from the Christian standpoint. It was first ed. by Valla (1538), and was trans. into English by George Wither (1636). See A. Bender, *Untersuch. über Nemesius*, 1898.

**Nemetodurum**, see NANTERRÉ.

**Nemophila**, genus of hardy annuals (family Hydrophyllaceae) with blue or white flowers and pinnatifid leaves. *N. menziesii*, and varieties, of *N. America*, is grown in gardens.

**Nemours, Louis Charles Philippe Raphaël d'Orléans, Duc de** (1814-96), second son of Louis Philippe of France. The title of Duc de N. was first borne by the Armagnac family, and was revived in Louis Philippe. He was offered, but refused, the throne of Greece (1825) and of Belgium (1831). He fought in the Algerian expedition (1836-41), and after the revolution of 1848 lived in England till 1870.

**Nemours, Fr. tn** in the dept of Seine-et-Marne, on the Loing, a popular resort of Parisians. It has gravel and stone quarries. Pop. 5300.

**Nemptodurum**, see NANTERRÉ.

**Nen**, or **Nene**, riv. rising in the W. of Northants, England, and flowing past Northampton and Peterborough into the Wash. Length 90 m. The N. is connected with all the central waterways of England by canal.

**Nenagh, cap.** and assize tn of the N. riding of co. Tipperary, Rep. of Ireland, 11 m. ENE. of Killaloe and 5 m. from Lough Derg. N. Castle is a Norman circular keep (c. AD 1200). Industries include agriculture, slate quarrying, and aluminium and textile manuf. Pop. 4400.

**Ne-Ne**, or **Hawaiian Goose**, species of goose related to the Canada goose (q.v.) but with shorter wings and reduced webs on the feet. About a hundred years ago some 25,000 N.s lived on Hawaii, but the introduction of pigs, cats, dogs, and rats (and the mongoose) has almost led to the extinction of this ground-nesting bird. Writing in June 1952, Peter Scott stated that 32 Hawaiian geese survived. Steps are being taken to save this species.

**Nenets** (Russian pl. *Nentsy*), Samoyed (q.v.) people living on the shores of the Polar ocean from the White Sea in the W. to the Yenisey in the E. Nenets Nat. Dist. (formed 1929) lies W. of the Urals, in the Archangel oblast (q.v.), and includes the northern section of the Pechora coal basin. There is reindeer raising, fishing, hunting, and coal-mining. The cap. is Nar'yan-Mar. It is an area of banishment (since 17th cent.) and labour camps. Area 67,300 sq. m.; pop. (1956) 37,000,

(1937, 28,000), mostly Russians and Nenets.

**Nennius, St** (fl. 6th cent.), Irish abbot, one of the 'Twelve Apostles of Ireland.' The details of his life are unknown, except that he was a disciple of St Finnian of Clonard.

**Nennius, Brit. historian** (fl. early 9th cent.), compiler of the *Historia Brittonum*, of which there are sev. versions; the chief MSS. are the Cambridge, the Vatican, and the Harleian. He lived on the borders of Mercia and Wales. The book commences with a purported account of the colonisation of Britain by the Anglo-Saxons. It is an uncritical jumble of history and legend, and chronologically unreliable, but modern scholarship has shown that it contains much valuable material on a little-known period of Eng. hist. Geoffrey of Monmouth (q.v.) used N.'s work as a basis for his own, but with considerable additions which make it historically far less valuable than the original.

**Neocastro**, see NAVARINO.

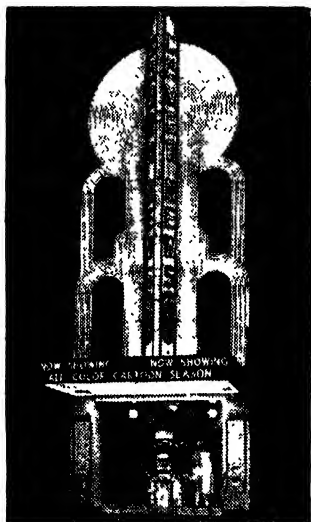
**Neodymium**, metallic element, symbol Nd, atomic number 60, atomic weight 144.3. Didymia is one of the oxides known as the gadolinite earths; it was formerly supposed to be the oxide of a metal didymium. Didymium was, however, split up into 2 components, N. and praseodymium, in 1885. The former gives rise to pink salts and the latter to green. See RARE EARTHS.

**Neo-Hellenic**, see ROMANIC.

**Neo-Kantianism**, or **Neo-Kantism**, is the philosophy of Kant (q.v.) as taught and interpreted by his successors. Notable among these in modern times are Meyerson, Helmholz, Riehl, and Hermann Cohen. Meyerson approaches philosophy from the direction of natural science, whose aim, he holds, is the discovery of rationality in things, that is, the reduction of differences to an identity which absorbs them all. His work, which may be termed a theory of knowledge, was supported by Einstein, and may briefly be described as a belief in the uniformity of nature and its response to speculative inquiry. Helmholz, with whom may be mentioned Hannequin, declares that the principle of causality is nothing else than the supposition that all phenomena of nature are subject to law, that the cause of a phenomenon is therefore the law, though he later modified this somewhat dogmatic statement by an acknowledgment that he has followed Kant too closely, maintaining finally that the principle of causality was only a hypothesis of the reign of law in all phenomena (see his treatise *Über die Erhaltung der Kraft*, 1847). Colding, the Dan. physicist, a year after Meyerson's first treatise, brought forward an independent proof of the axiom of the conservation of energy and confirmed it experimentally; he also assumed it to be a law of reason. It is in connection with present-day ventures into psychological study that a revival of interest in Kant's theories has most extensively occurred; and in the confusion which many thinkers to-day experience between psychology and theory of knowledge, Kant's clear

doctrines propounded in his *Critique of Pure Reason* serve to dispel the difficulty of demarcation. He definitely stated that the *Critique of Pure Reason* was not to be regarded as an inquiry into psychological phenomena, but rather as a study of the criticism and possibilities of experience. See H. Helmholtz, *Wissenschaftliche Abhandlungen*, 1882, and *Verträge*, 1896; L. Rougier, *Philosophy and the New Physics*, 1922; H. Höfding, *History of Modern Philosophy*, 1924; E. Meyerson, *Identity and Reality*, 1930.

Neolithic (New Stone Age), see FLINT IMPLEMENTS and STONE AGE.



Claudgen

#### NEON LIGHTING

An installation in which 3000 ft. of tubing are employed. The vertical name sign is in 2-ft. letters illuminated by ruby-red tubing.

Neon (Gk, 'new'), chemical element, symbol Ne, atomic number 10, atomic weight 20.2. N. is one of the constituents of the atmosphere, of which it forms about 1 part in 100,000 by volume. It was discovered in 1898 by Sir W. Ramsay and Prof. M. W. Travers. N. mixed with other inert gases is used in gas-filled electric lamps, and for advertisement purposes in electric discharge tubes, in which a variety of shapes and colours is possible. Pure N. only produces 1 colour—red. N. discharge tubes are also used in aerodrome beacons, because of the fog-penetrating powers of the light they produce. Chemically N. is completely inert; it forms a member of the group of inactive gases. See INERT GASES.

Neophyte (Gk *neophytos*, newly planted), name given by the primitive Church to

the new Christians, that is, to the pagans who had newly embraced Christianity and had been baptised. The term is still used by Rom. Catholic missionaries to denote a convert from heathenism. In general language, newly entered upon, e.g. Ben Jonson's 'neophyte player'.

Neoplatonists, name given to an illustrious succession of anc't philosophers who claimed to found their doctrines and speculations on those of Plato. It is not easy to say with whom Neoplatonism commenced. Scholars differ as to how much should be included under that term. By some it is used to designate the whole new intellectual movement proceeding from Alexandria, comprising, in this broad view, the philosophy, first, of Philo Judaeus and of Numenius the Syrian; second, of the Christian Fathers (Clemens Alexandrinus, Origen, etc.); third, of the Gnostics; and fourth, of Ammonius Saccas and his successors. Others, again, would exclude the second of these (though the Alexandrian divines frequently Platonise), while a third party is disposed to restrict the application of the term to the fourth. The last of these modes of regarding Neoplatonism is the one most current. A fresh stream of life was first poured into the old channels of Platonic speculation by Ammonius Saccas and Plotinus, and it is this fact which gives the school which they estab. its best claim to the exclusive title of *Neoplatonist*. The essence of all the Alexandrian speculations consists in the blending of Platonic ideas with oriental mysticism; the peculiarity of the N., strictly so called, lies simply in the novelty, audacity, and ingenuity of their reasonings. They aimed at constructing a religion on a basis of dialectics. They strove to attain a knowledge of the Highest by assuming the existence of a capacity in man for passing beyond the limits of his personality and acquiring an intuitive knowledge of the absolute, the true—that which is beyond and above the fluctuations and dubieties of 'opinion.' This impersonal faculty is called *krasia*. Plotinus, in fact, set out from the belief that 'philosophy' (i.e. 'Absolute Truth') is possible only through the identity of the thinker, or rather of the subjective thought, with the thing thought of, or the objective thought. The God of Plotinus and the other Alexandrians is a mystical Trinity. The Divine Nature contains within it 3 Hypostases (Substances); its basis, if we may so speak, is called Unity, also poetically Primitive Light. From 'Unity,' as the primordial source of all things, emanates 'Pure Intelligence' (*Nous*); its reflection and image, that by which it is intuitively apprehended; from 'Pure Intelligence, in turn, emanates the 'Soul of the World' (*Psyché tou pantos*), whose creative activity produces the souls of men and animals and 'Nature'; and finally, from Nature proceeds 'Matter,' which, however, is subjected by Plotinus to such refinement of definition that it loses all its grossness. Unity, Pure Intelligence, and the World-Soul thus constitute the Plotinian Triad. Other Neoplatonic philosophers were Porphyrius,

Iamblichus, Aedesius, and Proclus. See A. Richter, *Neoplatonische Studien*, 1864-1867; C. Bigg, *The Christian Platonists*, 1886, and *Neoplatonism*, 1895; A. Drews, *Plotin*, 1907; T. Whittaker, *The Neoplatonists*, 1921; W. R. Inge, *The Philosophy of Plotinus*, 1923; N. A. Robb, *Neoplatonism of the Italian Renaissance*, 1935; R. E. Witt, *Albinus and the History of Middle Platonism*, 1937; P. V. Pistorius, *Plotinus and Neoplatonism*, 1952.

**Neo-populism**, ideological trend in Soviet Russia in the 1920's headed by Prof. Chelintsev. It was a further development of Liberal Populism (see POPULISM) and insisted on the basis of empirical studies that Marxist theory was not applicable to the peasant economy and that the best course in agric. policy would be to support individual peasant farming and encourage peasant co-operatives. The Communists considered N. an ideology of the *kulak* (q.v.), and with the beginning of the collectivisation of agriculture (q.v.) N. was suppressed and its leaders imprisoned.

**Neoprene**, form of synthetic rubber produced in America, the first to be commercially successful. It is obtained from butyl chloride, and may be vulcanised with zinc oxide.

**Neoptolemus**, son of Achilles and Deidamia, also called Pyrrhus. At the death of his father, Ulysses took him to Troy, and he entered Troy in the wooden horse. At the fall of Troy he slew the aged Priam. Among the captives Andromache (q.v.), widow of Hector, was given to N. Ultimately he wedded Hermione, daughter of Menelaus, previously betrothed to Orestes, and was slain by the latter.

**Neosho**, riv. rising in Morris co., Kansas, U.S.A., and flowing into NE. Oklahoma to join Arkansas R. NE. of Muskogee. Length 460 m.

**Neottia nidus-avis**, Bird's Nest Orchid, native to Britain, with a dense spike of brown flowers in early summer, growing usually under oak- or beech-trees.

**N.E.P.**, see NEW ECONOMIC POLICY.

**Nepal**, independent native kingdom on the NE. frontier, India, comprises a portion of the S. slope of the Himalayas; it is bounded on the north by Tibet, on the S. and W. by Uttar Pradesh and Bihar, India, and on the E. by Sikkim and Bengal. The state is separated from the plains of India by the long, narrow strip of land, resembling Eng. downs, but unhealthy, called the Terai, which extends along the whole S. border. North of this, and running parallel with it, is the great forest of N., from 8 to 10 m. broad, abounding in wild animals. Still further north is a tract of hilly country, and above that are 2 tracts of greater elevation, which include among their peaks Mt Everest (29,141 ft), Dhaulagiri (26,286 ft), and Makalu (27,790 ft). The prin. rivs. are the Kurnali, the Rapti, the Gunduk with its great tribs., and the Sun Kosi. The climate, most unhealthy in the Terai, is healthy and pleasant in the hilly and mountainous dists., suggesting that of S. Europe. Rice, maize, and millets are the

prin. crops. The Ghurkhas (q.v.) (Gurkhas or Nepalese) are divided into numerous tribes, the largest being Magars, Gurungs, Newars, and Bhutias (Bhotias), the aboriginal stock being Mongolian. Hinduism is the predominant religion. Since the treaty of Sagauli (1815) Brit. relations with N. have been friendly. Hostilities between N. and Tibet broke out in 1854 and ended in a treaty in 1856 under which Tibet paid an ann. tribute and promoted trade relations with N. The cap. is Khatmandu (q.v.) (pop. 108,800). Under a royal proclamation in 1951 the state is administered by the maharajah, King of N., with an advisory assembly, a Prime Minister, and a Cabinet. N. is in close and commercial relations with the Indian Gov. In the First and Second World Wars N. gave unstinted aid to the Brit. Gov. in men, money, and material. Much attention has recently been given to communications, and in 1954 a road was opened between Khatmandu and the railroad at Amlekganj. There is an air service between Khatmandu and Calcutta. N. is of great archaeological interest, being connected with the life of Buddha. Area 54,000 sq. m.; pop. 8,400,000. See Col. W. Kirkpatrick, *Account of the Kingdom of Nepal*, 1811; W. Hamilton, *An Account of the Kingdom of Nepal*, 1819; P. Landon, *Nepal*, 1928; W. B. Northey, *The Gurkhas: Manners and Customs*, 1928, and *The Land of the Gurkhas*, 1937; H. Davis, *Nepal, Land of Mystery*, 1942; S. Cutting, *The Fire Ox and Other Years*, 1947; R. N. W. Bishop, *Unknown Nepal*, 1952; H. W. Tilman, *Nepal Himalaya*, 1952.

**Nepenthes**, genus—the only one of the family Nepenthaceae—of remarkable shrubby plants with small green or brown flowers, borne in long racemes, and with leaves dilated at the ends into pitcher-shaped appendages with a lid-like lamina. The broad, strap-shaped portion of the plant, which resembles a leaf blade, is the wing petiole or leaf-stalk. The size of the pitcher varies from that of a thimble to about 20 in. in length, with a capacity of about 2 quarts. The pitchers act as traps for insects and larger animals, attracted both by the bright colours of the pitchers and by a honey-like secretion round the entrance, which provide nitrogenous food for the plant. About 30 species are known, mostly natives of tropical Asia and the Malay Is. The culture of N.s is easy if abundance of moisture and a tropical temp. can be provided. The pitchers must be kept partly filled with water. The roots should be set in well-drained baskets containing peat fibre and sphagnum.

**Nepeta**, see CATMINT.

**Nepheline**, rock-forming mineral whose formula is  $\text{Na}_2\text{Al}_2\text{Si}_2\text{O}_{10}$ . Its crystals are transparent, have a hardness of 5½, and sp. gr. 2.6. Two varieties of the mineral are known: glassy N., in small, transparent crystals, occurring in late volcanic rocks, and elaeolite, large crystals; or massive, with varying colours owing to the presence of other minerals. When of a good colour, examples of elaeolite are cut as gems.

**Nepheline Syenite**, rock of plutonic origin containing essentially alkali-feldspars and nepheline, together with other accessory minerals. Sodalite often accompanies it.

The only important N. S. found in Great Britain occurs near Loch Borolan in Sutherland in Scotland. N. S. is found in Scandinavia, the U.S.S.R., and many parts of Africa.

**Nephelium**, see EUPHORIA.

**Nephrite**, more common form of Jade (q.v.) or **Axestone**, is a hard mineral (hardness 7 and sp. gr. 3), massive, compact, very tough, and without any cleavage. In colour it varies from white to bluish-green, and may be blotched or veined. It is sometimes translucent, and is greasy to the touch. In composition it is a silicate of magnesia and lime, although some alumina and oxide of iron are often present. Some mineralogists regard it as a massive form of tremolite. It is found in granite, gneiss, greenstone, etc. It was confused with jadeite until Damour (1863) showed that jadeite was silicate of alumina and lithia, which is fusible, whereas N. is infusible. N. takes a beautiful polish, and is highly prized for ornaments, especially the bright green varieties. The Turks made it into handles for sabres. Many imaginary virtues have been ascribed to it. Thus people once wore it as a charm against epileptic fits and nephritic (Gk. *nephros*, the kidneys) complaints; hence its name. The prin. sources of the mineral at the present day are New Zealand, China, NW. America, Corsica, and Egypt.

**Nephritis**, inflammation of the parenchyma (essential tissue) of the kidneys. *Acute glomerulo-N.*, or Bright's disease, is an acute inflammation of the glomeruli (see KIDNEY). It is often related to a haemolytic streptococcal infection elsewhere in the body and occurs particularly in connection with scarlet fever and streptococcal sore throats. *Acute glomerulo-N.* is characterised by markedly diminished output of urine—sometimes almost complete suppression—albumen in the urine (albuminuria), blood in the urine (haematuria), raised blood pressure, and oedema. The inflammatory process renders the glomeruli incapable of performing their normal function of filtering fluids, salts, and urea from the blood stream, and it is this impairment of function which causes the oliguria (diminished output of urine), the hypertension, and the oedema. The haematuria and albuminuria are products of the glomerular inflammation. The greater the degree of glomerular inflammation, the greater the impairment of function and the more marked the symptoms. Severe and untreated acute glomerulo-N. may lead to complete renal failure and death. *Chronic glomerulo-N.*, or chronic Bright's disease, may follow an unresolved acute condition or may start insidiously without previous acute symptoms. It is a progressive disease, producing in a chronic form the same impairment of function as the acute form. *Acute interstitial N.*, a form of nephritis

in which the inflammation affects the tissues in between the glomeruli rather than the glomeruli themselves. Consequently the signs and symptoms are fewer than in glomerulo-N., since the function of the glomeruli is not impaired to a similar extent. Interstitial N., however, may lead to fibrotic contraction of the kidneys and impaired function later in life.

**Nephrosclerosis**, disorder of the vascular system of the kidneys due to arteriosclerosis (q.v.). Owing to the arteriosclerosis the blood supply to the kidneys is diminished and impairment of function results. N. is always associated with high blood pressure. In the elderly, N. results from a generalised hardening of the arteries; the progress of the disease is slow and in some cases is part of the inevitable wearing-out process to which senile tissues must eventually succumb. An acute, progressive form of N., known as *malignant hypertension*, occurs in middle-aged persons. In this condition the arteriosclerosis is not generalised but localised to the renal vascular system. A very high blood pressure is the rule in malignant hypertension and it is a grave disease, the cause of which is not fully understood. Treatment in many cases fails to arrest its rapid progress towards a fatal termination from uraemia (q.v.) and cardiac failure.

**Nephrosis**, inflammation of the tubules of the kidneys (q.v.) and frequently associated with glomerulo-nephritis (see NEPHRITIS).

**Nepigon Lake**, see NIPIGON.

**Nepomuk**, or **Pomuk**, John of, patron saint of Bohemia, see JOHN ST.

**Nepos**, Cornelius (c. 100-c. 25 BC), Rom. historian; friend of Cicero, Atticus, and Catullus. His prin. work was entitled *De viris illustribus*, of which considerable portions survive in what is believed by some to be an epitome by Aemilius Probus. See the ed. of O. Wagner, 1922; also the text with Eng. trans. by J. C. Rolfe (Loeb Library), 1929.

**Nepos**, Flavius Julius (d. AD 480), last but one of the emperors of the W., b. Dalmatia. He was the nephew of Marcellinus and the son-in-law of Leo I, Emperor of the E., who proclaimed N. Emperor of the W. in 474. He crushed his rival Glycerius and made peace with the Visigoths by ceding to them the Gallic prov. of Auvergne. He was driven out of Italy by Orestes (475), but retained some authority in Dalmatia until his murder in 480 at Salona.

**Neptune**, see POSEIDON.

**Neptune**. The discovery of N. is the most triumphant record of mathematical astronomy. Adams of Cambridge (1845) and Leverrier of Paris (1846) both determined its position from no other data than certain perturbations of Uranus. Galle, instructed by Leverrier, found the planet on 23 Sept. 1846, within half an hour. The magnitude lies between 8 and 9 and it is invisible to the naked eye, though visible through a good opera glass as a greenish disk; angular diameter at mean opposition, 2.52", real diameter

33,000 m., but a little uncertain; volume, 72 times that of the earth, its mass 17 times; density, 0.24. The mean distance does not follow Bode's law, being 2793 million m. from the sun; the orbit has an eccentricity of 0.0086, the least with the exception of Venus, making a difference of solar distance of 48,000,000 m. Inclination of orbit,  $14^{\circ}$ ; revolution completed in a little less than 165 years at a velocity of about 34 m. per sec., rotation not yet determined, though probably about 16 hrs. The spectrum, the light being feeble, is difficult to determine, and indicates the presence of a dense atmosphere similar to that of Uranus; a dark band in the red was identified in 1932 by Dunham as due to methane. *Satellites*: (1) Triton, discovered by Lassell in 1846; distance 223,000 m.; period 5 days 21 hrs 27 min.; orbital inclination,  $34^{\circ} 53'$ , moving backwards like those of Uranus. (2) Nereid, discovered 1 May 1949 by Kuiper at the McDonald Observatory, Fort Davis, Texas. Distance from N. 3,500,000 m., diameter 200 m.; period, nearly 1 year; moving backwards close to plane of ecliptic.

**Nérac**, fr. tn. cap. of an arron., in the dept of Lot-et-Garonne, on the Baïse. It has a trade in wine, brandy, horses, and poultry. Pop. 6000.

**Nerohinsk**, tn in the Chita oblast of SE. Siberia, 130 m. E. of Chita. It is the historical centre of an area with large deposits of gold, non-ferrous and rare metals, worked by convicts. It was founded in 1653; the Russo-Chinese treaty was signed here in 1689. Pop. (1937) 15,000.

**Nereid**, satellite of Neptune (q.v.).

**Nereids**, nymphs of the Mediterranean Sea, daughters of Nereus and Doris, the most famous of whom were Amphitrite, wife of Poseidon, Thetis, mother of Achilles, and Galatea. The Naiads were the nymphs of fresh water, and the Oceanides the nymphs of the great ocean. See also NYMPHS.

**Neretva** (formerly Naro, or Narenta), riv. of Yugoslavia, one of the few considerable rivs. flowing into the Adriatic. It rises near Mt Zelengora in Hercegovina, flows NW. and then SW., and enters the sea near Metrovic. The mouth of the riv. is marshy.

**Nereus**, Gk god of the sea, son of Pontus and Gaia. He married the Oceanid Doris, by whom he became father of the Nereids (q.v.). He was a prophet and could change his form at will. He is generally represented as a calm and gentle old man with a trident.

**Nergal**, deity in the Babylonian and Assyrian pantheon. N. was a god of war and hunting and was identified with the sun in its adverse effects (e.g. bringing disease), and thus god of the underworld. Possibly of Hamitic origin, and by some identified with Nimrod, N. was associated with the planet Mars.

**Neri, Philip, St** (1515-95), b. Florence. In 1550, with sev. of his friends, he estab. a confraternity for the care of poor pilgrims visiting Rome, as well as of the sick generally, which has numbered among its

associates many of the most distinguished members of the Rom. Catholic Church. This confraternity was the germ of the more celebrated Congregation of the Oratory, which was founded by St Philip in concert with his friends Baronius and Tarugio, both afterwards cardinals, Sabriati, and some others. The main object of this association was the moral instruction and religious training of the young and uneducated. St Philip was canonised by Gregory XV in 1622. His feast is on 26 May. See L. Pennelle and L. Bordet, *Saint Philip Neri and the Roman Society* (Eng. trans.), 1932.

**Nerine**, genus of S. African bulbous plants, family Amaryllidaceae, about 18 species; *N. sarniensis*, the Guernsey Lily, and *N. flexuosa* are popular garden forms.

**Néris-les-Bains**, Fr. spa in the dept of Allier, near Montluçon. It has Rom. remains and a curious Romanesque church. Pop. 4300.

**Nernst, Walther** (1864-1941), Ger. physicist, studied in Zürich, Berlin, Graz, and Würzburg. Prof. at Munich, 1894, and Berlin, 1905-33. He did much valuable work on the third law of thermodynamics (q.v.) and its applications to thermochemistry. He was awarded the Nobel prize in 1921.

**Nero** (AD 37-68), Rom. emperor, b. Antium, the son of Cn. Domitius Ahenobarbus and of Agrippina, daughter of Germanicus Caesar. His mother becoming the wife of the Emperor Claudius, Claudius adopted him (AD 50), and his name, originally L. Domitius Ahenobarbus, was changed to N. Claudius Caesar Drusus Germanicus. After the death of Claudius (AD 54) the Praetorian Guards, at the instigation of Atrianus Burrhus, their prefect, declared him emperor instead of Claudius's son Britannicus. His reign began with the semblance of moderation and good promise, under the guidance of Burrhus and his tutor Seneca the philosopher; but the baleful influence of his mother, together with his own moral weakness and sensuality, frustrated their efforts, and he soon plunged headlong into debauchery, extravagance, and tyranny. He caused Britannicus, the son of Claudius, to be treacherously poisoned at the age of 14, and afterwards (AD 59) caused his own mother, Agrippina, to be assassinated, to please his mistress, Poppaea Sabina (the wife of his prin. boon companion, Otho, afterwards emperor), in order to marry whom he also divorced and afterwards put to death his wife Octavia, the sister of Britannicus. The low servility into which the Rom. senate had sunk at this time may be estimated from the fact that it actually issued an address congratulating the hateful matricide on the death of Agrippina. The affairs of the empire were at this time far from tranquil. In AD 61 an insurrection broke out in Britain under Queen Boudicca, which was, however, suppressed by Suetonius Paulinus. At home matters were not much better. The emperor was lampooned in verse; the senate and priesthood, alike venal, were also satirised by

audacious malcontents; Burrhus, a valuable friend, &c.; and even Seneca, though not a great moralist, outside his books, thought it only decent to retire from court. In July 64 occurred a great conflagration in Rome, by which two-thirds of the city was reduced to ashes. N. himself is usually believed to have been the incendiary. It is said that he admired the spectacle from a distance reciting verses about the burning of Troy, but many scholars doubt whether he really had any hand in it. At all events, he laid the blame on the Christians, and persecuted them with the utmost cruelty.



NERO  
Vatican, Rome.

He rebuilt the city with great magnificence, and reared for himself on the Palatine Hill a splendid palace, called, from the immense profusion of its golden ornaments, the *Aurea Domus*; and in order to provide for this expenditure, and for the gratification of the Rom. populace by spectacles and distributions of corn, Italy and the provs. were unsparingly plundered. A conspiracy against him failed in the year 65, and Seneca and the poet Lucan fell victims to his vengeance. In a fit of passion he murdered his wife Poppaea by kicking her when she was pregnant. He then proposed to Antonia, the daughter of Claudius, but was refused, whereupon he caused the too fastidious lady to be put to death, and married Statilla Messalina, after killing her husband. His vanity led him to seek distinction as a poet, a philosopher, an actor, a musician, and a charioteer; and he received sycophantic applause, not only in Italy, but in Greece, to which, upon invitation of the Gk cities, he made a visit in 67. But in 68 the Gallic and Sp. legions, and after them the Praetorian Guards, rose against him to make Galba emperor, and N. fled from Rome to the house of a freedman, Phaon, about 4 m.

distant. The senate, which had hitherto been most subservient, declared him an enemy of his country, and the tyrant ended his life by suicide on 9 June 68. See B. W. Henderson, *Life and Principate of the Emperor Nero*, 1903; M. P. Charlesworth (editor), *Documents Illustrating the Reigns of Claudius and Nero*, 1939; C. M. Franzero, *Life and Times of Nero*, 1954.

Nero, Gnaeus Claudius, Rom. general who was consul in 207 BC. In that year he intercepted Hasdrubal, who was crossing from Spain to Italy with reinforcements for Hannibal, and severely defeated him at the battle of the Metaurus. Over 50,000 Carthaginians perished, and amongst them Hasdrubal himself. N. was censor sev. years later.

Nero, Tiberius Claudius, Rom. soldier, served as quaestor under Caesar in 47 BC, was on the side of Brutus after the latter's death, but was later reconciled to Octavian. He is principally known as the husband of Livia Drusilla, and father of her 2 sons Drusus and Tiberius, the latter of whom became emperor. In 38 Octavian divorced his wife, Scribonia, and married Livia, who had obtained a divorce from N.

Neroli, Oil of, see ORANGE.

Nertchinsk, see NERCHINSK.

Nerthus, see HERTHA.

Neruda, Jan (1834-91), Czech writer, best known for his poems and short stories. Pub. 6 major collections of poems between 1857 and 1896 (posthumous). He was analytical, ironical, self-critical, a careful rather than a spontaneous writer, and avoided society. Besides poetry and short stories, he engaged in nearly every other form of literary activity (journalism, art criticism, drama, etc.).

Neruda, Wilma, see HALLÉ, LADY.

Nerva, Marcus Cocceius, Rom. emperor (AD 96-8), b. Narnia, Umbria, AD 30. On the assassination of Domitian N. was declared emperor by the praetorian guards, and his administration restored tranquillity to the state. The class of informers was suppressed; and N. swore that he would put no senator to death, a promise which he faithfully observed. See B. W. Henderson, *Five Roman Emperors*, 1927.

Nerval, Gérard de (1808-55), adopted name of Gérard Labrunie, a Fr. man of letters. In 1828 he pub. a trans. of Goethe's *Faust*, and later on he collaborated with Théophile Gautier. He was a great traveller, and narrated his adventures in the *Revue des deux mondes*. His most interesting literary contribution is his *Aurélien, ou le rêve et la vie*, 1855, a record of his own insanity; perhaps his best work is his collection of stories, *Contes et facéties*, 1852. See R. Bizet, *La Double Vie de Gérard de Nerval*, 1928; K. Haedens, *Gérard de Nerval, ou la sagesse romantique*, 1939; S. A. Rhodes, *G. de Nerval: poet, traveller, dreamer*, 1951.

Nerves, see NERVOUS SYSTEM.

Nervi, It. seaside resort, in Liguria (q.v.). It is on the Riviera (q.v.), 4 m. E. of Genoa (q.v.), and has beautiful gardens and olive groves. Pop. 9000.

Nervii, powerful Gothic tribe which



inhabited Hainaut, parts of Brabant and E. Flanders, and the prov. of Antwerp. In 57 BC they were defeated by Julius Caesar at the battle of the Sambre (*Bell. Gall.* ii. 15-28).

**Nervous System**, that part of the mechanism of the body whose special function is the co-ordination and control of the activities of the organs. The system is composed of nerve-cells or neurons, which are linked together and capable of sending impulses from one to the other. In other words, the nerve-cell has a life or metabolic existence of its own, which is modified in a particular manner by certain stimuli received from outside itself, and which modifies the metabolism of an adjacent nerve-cell or certain other cells, such as those of muscle. In this way impulses are conveyed from the exterior to centres within the body, and from such centres to other centres or to other tissues. The effects of what may be called nerve-currents are divisible into 3 classes: those changes which involve movements in certain structures, as the contraction of a muscle; those changes which involve modifications in consciousness, as a special or general sensation; and those changes which are merely chemical, that is, which stimulate the production of certain substances, as in the various secretory organs. The different nerves are responsive to different stimuli, and each nerve transmits its impulse in one direction only. The latter property has given rise to the distinction between efferent and afferent nerves: those that conduct impulses outwards from a nervous centre, and those that conduct impulses towards the centre. The chief kinds of efferent nerves are: (1) Motor nerves, which convey currents to voluntary or involuntary muscles and excite them to contract; (2) accelerator nerves, which produce an increase in the rate of rhythmical action, such as those which make the heart beat at a greater speed; (3) inhibitory nerves, those which retard the rate of rhythmical motion, or stop it altogether; and (4) secretory nerves, those which cause secretion to flow out from the various glands. The chief kinds of afferent nerves are: (1) Those which convey impulses to the central system and there give rise to impulses to be carried away by efferent nerves, as in reflex action; (2) those which convey impulses giving rise to the special sensations of sight, hearing, etc.; (3) those which convey general or non-localised sensations; and (4) those which give rise to the experience of pain. The N. S. is also to be classified according to the anatomical disposition of the nerves and nervous organs. The most convenient classification involves 3 divs.; the central N. S., the peripheral N. S., and the sympathetic nerves. These divs. are somewhat arbitrary, but are sanctioned by custom and convenience. The central N. S. consists of the brain and spinal cord. The peripheral system consists of the cranial nerves, the spinal nerves, the sense organs, e.g. the eye and ear, and the motor end-plates. The sympathetic system consists

of the ganglia situated on either side of the spinal column, with their connections. Before describing these systems in detail the properties of nerve-substance in general must be discussed.

**Nervous tissue** is of 3 kinds: nerve-cells, nerve-fibres, and neuroglia, or connecting tissue. Nerve-cells vary greatly in form and size. The form of cell which makes up the brain and spinal cord consists of a protoplasmic nucleated body, from which arise certain processes. One process is known as the axis-cylinder process or axon, and the others are collectively called the dendrites. The axon possesses a uniform diameter and throws off collateral branches without diminishing in section; the dendrites divide into numerous branches, which taper off as they pass from the cell-body. The axon appears to be the structure by which communication is made between cell and cell, and it is an essential part, not only of a nerve-cell, but of a nerve-fibre. In some fibres the thread-like axon becomes sheathed with a substance called myelin; it is then called a medullated fibre; if the sheath is absent, it is called a non-medullated fibre. Whether medullated or not, the fibre may possess a thin sheath called the primitive sheath or neurilemma, placed externally to the myelin if the fibre is medullated. The part of the brain and cord which contains nerve-cells is called grey matter, while the white matter of the brain and cord is made up of medullated fibres without a primitive sheath. The nerve-fibres which proceed to the various parts of the body are bound up in bundles which we call nerves.

**Central nervous system.** The central or cerebro-spinal system consists of the brain and the spinal cord, both of which are elsewhere described. The most important part of the brain is the cortex, which is made up of grey matter. There are subsidiary masses of grey matter in the interior of the brain, in the cerebellum, and in the spinal cord. It is in this grey matter that voluntary action arises, and to it are also brought the impulses which give rise to sensation. The subsidiary masses of grey matter are concerned with involuntary and reflex actions, while the white matter may be looked upon as a communicating medium only.

**Cranial nerves.** These nerves are concerned mainly with the supply of the head. There are 12 pairs of them, and they are spoken of by their numbers as well as their names: (1) The *Olfactory* nerve is purely sensory; it comes from the nose and proceeds to the cerebrum; it is the nerve of smell. (2) The *Optic* nerve is purely sensory; it enters the eyeball at the rear and connects with the cerebrum by way of subsidiary masses of grey matter called the *corpora quadrigemina* and *corpora geniculata*. (3) The *Oculomotor* nerve is purely muscular, and supplies most of the muscles of the eye. (4) The *Trochlear* nerve is muscular, and supplies the superior oblique muscle of the eye. (5) The *Trigeminal* nerve is mainly sensory. It divides into 3 main branches for the upper, middle, and lower portions of the

head and face region. It has a smaller motor branch for the muscles of mastication. (6) The *Abducens* nerve is motor and supplies the external rectus muscle of the eye. (7) The *Facial* nerve is a motor nerve, supplying the facial muscles. Injury to this nerve causes the loss of all power of facial movement and expression. (8) The *Auditory* nerve is divided into 2 parts: the *cochlear* nerve, which is the true nerve of hearing, and the *vestibular* nerve, which connects with the semicircular canals and conveys those impulses which enable the body to be kept in equilibrium. (9) The *Glossopharyngeal* nerve is mixed sensory and motor. Certain muscles of the pharynx are impelled to action by it, while other fibres are concerned in sense of taste. (10) The *Vagus* or the *Pneumogastric* nerve has varied functions; it contains fibres which convey motor impulses to the stomach and intestines, afferent impulses from the lungs, etc. (11) The *Spinal Accessory* nerve contains motor fibres for the larynx and some inhibitory fibres for the heart; it also supplies a few muscles in the neck and back. (12) The *Hypoglossal* nerve is the motor nerve for the tongue muscles.

The *Spinal* nerves arise from the spinal cord and run out through holes between the vertebrae to supply the trunk and limbs, though some of the upper ones are concerned with the head and face. The div. into spinal and cranial nerves is arbitrary and not real. There are 31 pairs of spinal nerves, whose names depend on the part of the spinal column from which they pass. Thus there are 8 cervical, 12 dorsal, or thoracic, 5 lumbar, 5 sacral, and 1 coccygeal. Each spinal nerve is a mixed nerve, containing both motor and sensory fibres. As they emerge from the spinal cord, the motor and sensory bundles are separated. The sensory fibres come from the back of the spinal cord; their point of emergence is called the posterior root, and a spinal ganglion is situated at that point, consisting of a collection of nerve-cells which have 2 axis-cylinders proceeding from them, by which the cells communicate in one direction with the skin, and in the other with the spinal cord or brain. The motor fibres sprout from the grey matter of the spinal cord, and proceed by way of the anterior roots to the mixed nerves, and thence to their destination in the end-plates of the voluntary muscles.

*Sympathetic system.* Some of the anterior root fibres pass to a chain of ganglia running down on each side of the vertebral column and called the sympathetic chain. These ganglia consist of nerve-cells, and the fibres from the anterior roots branch round these cells and stimulate them to send out impulses by their own axis-cylinder processes to the involuntary muscles. The medullated fibres which carry the impulses from the spinal cord to the ganglia are termed pre-ganglionic; those which start from the ganglia are non-medullated and are called post-ganglionic. The impulses which affect the involuntary muscles must not be understood to originate in the

ganglia. The ganglia serve as redistributing stations, where an impulse received from one afferent fibre may be communicated to a number of cells in the ganglion which convey by their own axis-cylinders the impulses to the various involuntary muscles. Among muscles served are those which effect the peristaltic movements of the alimentary tract, those which constrict the arteries and regulate the circulation, including the muscles of the heart to some degree, the unstriped muscles of the lungs and windpipe, those which control the size of the pupil of the eye-ball, those connected with the sweat glands of the skin, etc. See H. Gray, *Anatomy* (31st ed.), 1954, and S. W. Ranson, *Anatomy of the Nervous System* (9th ed.), 1953.

Nesbit, Edith, see BLAND.

Ness (Eng. *nose*; A.-S. *naese*; Ger. *Nase*; Icelandic *nes*; Lat. *nasus*; Fr. *nez*), geographical termination signifying promontory. Names in -ness abound among the Orkney and Shetland Is., and on the coast of Caithness; and along the E. coast of Great Britain as far as Dungeness in Kent. As the corresponding termination -ness prevails in Scandinavia, the existence of names in -ness in Britain is held as an evidence of Scandinavian colonisation.

Ness, Loch, long, narrow lake in Inverness-shire, Scotland, extends NE. and SW. and is 23 m. in length and 1½ m. in average breadth. It receives the Moriston, the Oich, the Foyers, and other streams, and its surplus water is carried off to the Moray Firth by the Riv. N. In many places it is 130 fathoms in depth. There is much controversy over the reported appearances of a supposititious monster in the loch.

Nesselrode, Count Karl Vasil'yevich (1780-1862), Russian statesman of German origin, b. Lisbon. He was foreign minister, 1814-56, and took part in the congresses of Vienna, Aachen, Troppau, Laibach, and Verona, always succumbing to the influence of Metternich. He signed the peace treaty of Paris at the end of the Crimean War.

Nessus, see CENTAURS and HERCULES.

Neston, urb. dist. of Cheshire, England, 12 m. from Chester. It stands on the estuary of the Dee. Pop. 9922.

Nestor, legendary son of Neleus, King of Pylos. When Pylos was attacked by Hercules he alone of the 12 brothers was spared. He fought against the Arcadians, Eleans, and Centaurs and took part in the siege of Troy. In old age he was renowned for his wisdom.

Nestorian Church, see NESTORIUS.

Nestorius (d. c. AD 450), b. Germanicia, a city of N. Syria, in the patriarchate of Antioch, probably studied under Theodore of Mopsuestia. After ordination at Antioch, he was chosen by the emperor, 428, as patriarch of Constantinople. Soon after his consecration a priest called Anastasius, who had followed Nestorius to Constantinople, in a sermon (by some ascribed to Nestorius himself) declared that the Virgin Mary could not truly be called 'Mother of God,' as she was only

the mother of the man Christ. Nestorius warmly defended this view, and elaborated it into the theory since known as Nestorianism which exaggerated the distinction of 2 natures in our Lord into a distinction of 2 persons, the human person of Christ and the Divine Person of the Word. In the controversy that ensued, Cyril of Alexandria condemned the doctrine of Nestorius, as did Celestine of Rome, with a threat of deposition and excommunication. Nestorius remaining firm in his opinions, a council was convened at Ephesus in 431, at which Cyril took the most active part, and in spite of the absence of the patriarch of Antioch and his bishops, Nestorius was condemned

of all liturgies still in use, and of great historical value, remarkable for having no words of institution in the consecration prayer; (2) that of Theodore; (3) that of Nestorius. These last also are old, though the first is the oldest. Uniate of Nestorian origin are called Chaldeans.

In their prosperous days under the Muslim rule, the Nestorians displayed an unparalleled missionary zeal and enterprise, to which Marco Polo bears witness, for he found their churches along all the trade routes from Bagdad to Peking (whence the legend of Prester John). Remains of their churches, which once flourished all over Asia, have been found in India (at Madras and Travancore), in



*British Railways*

#### LOCH NESS AT FORT AUGUSTUS

In the background is the Glengarry Forest, with the peak of Sron a Choire Ghaibh (3066 ft); in the middle distance is the Caledonian Canal (River Quich).

and deposed. Considerable opposition was offered to this, but ultimately Nestorius was confined in a monastery near Constantinople and after 4 years banished to the Greater Oasis in Upper Egypt. After sev. changes in his place of confinement, Nestorius *d.* in exile. See J. F. Bethune Baker, *Nestorius and his Teaching*, 1908, and G. R. Driver and L. Hodgson, *The Bazaar of Heracleides*, 1925.

*Nestorian churches.* The bishops of Edessa and Nisibis adhered to the teachings of Theodore of Mopsuestia and Nestorius, and found many supporters in Syria and Persia. The schismatic Church which they founded survived and flourished after the Muslim invasions until the Mongol incursions of the 13th and 14th cents. finally disrupted them and drove them to the mts of Kurdistan. There they still survive, a strange, hard-living, largely illiterate community, isolated from the rest of Christendom for cents. until befriended by the Anglican Church, fiercely retentive of their primitive rites, and governed by an hereditary patriarch, the Catholicos or Mar. They are known variously as Nestorians and Assyrians. Their service books survived in MS. until printed for them by the Anglicans. They have 3 anct liturgies: (1) that of the Holy Apostles Addai and Mari, the most anct

Ceylon, and in various parts of China. The Tartar invasions seem to have swept them all away, with the exception of a small community in Malabar. These claim to have been founded by St Thomas and St Bartholomew, but the origin of this legend is believed to be the fact that in 745 a band of Nestorian emigrants arrived there from Bagdad and Nineveh, led by one Thomas of Kana. Other emigrants joined them from Persia in 822. They lived there under their own king as a sort of Indian caste. The efforts of Pope John XXII to win them in 1330 failed, but in the 16th cent., when they were oppressed by the Muslims, they did ask help of the Portuguese, only to bring on themselves the Jesuits and the Inquisition. In 1599 at the Synod of Dampier they submitted under duress to Rome; but as the Dutch weakened the Portuguese grip on them, in 1653 they rebelled and chose Archdeacon Thomas to be consecrated bishop for them by the Nestorian Catholicos. The Portuguese foiled this attempt and also a second attempt to secure a bishop from the Copts. In 1665, however, their power was gone and, the Nestorian connection having now somehow been interrupted, Thomas was consecrated for them by a visiting Monophysite, the Jacobite Bishop of Jerusalem,

since when they have been Monophysites and in communion with the Syrian Jacobites. See A. J. Maclean and W. H. Browne, *The Catholics of the East and his People*, 1892; G. M. Rae, *Syrian Church in India*, 1892; J. Stewart, *Nestorian Missionary Enterprise*, 1918; A. Fortesque, *The Uniat Eastern Churches*, 1923; S. Gaselee, *The Uniates and their Rites*, 1925; B. J. Kidd, *The Churches of Eastern Christendom*, 1927; P. Saeki, *The Nestorian Monuments in China*, 1928; G. Dix, *The Shape of the Liturgy*, 1946.

**Nests**, in natural hist., are the places chosen or constructed by birds or any other animal for incubation, hibernation, or general residence. They vary enormously, from mere saucer-like hollows in the ground to some of the most elaborate and beautiful structures found in nature. Birds that are content with slight depressions in the ground, such as terns and plovers, lay eggs which so closely resemble the ground that they generally escape detection. A decided advance on this kind of nest is the burrow, such as that occupied by the sand-martin, kingfisher, or puffin. In many cases these underground N. are made in burrows left by rabbits or voles. Many birds and some animals make their N. in the hollows of trees; the female of the Bornean rhinoceros hornbill is sealed up by the male for many weeks, and thus absolutely protected. The mud N. of the swallow family and other birds are wonderful examples of industry. Some of these weigh as much as 8 or 9 lb. Among the crudest N. that are made with collected material, such as sticks, leaves, blades of grass, or hair, are those of the wood-pigeon, which are so loosely put together that the eggs are visible through them. The evolution of such N. to the complex structures of the finches or the wrens and their choice of site is plainly due to the instinct of concealment. Some fish and some insects and spiders have developed great nest-building craft. Various mammals such as harvest mice, squirrels, and rats also build N.

Swallows, martins, sparrows, and flycatchers prefer houses as nesting sites; the thrush tribe, finches, and linnets use evergreen bushes and hedges. Most species construct N. which are highly distinctive, and chaffinches produce those of the highest quality. The better builders also prefer a particular sort of site, especially the warbler, which adapts its nest perfectly to its position, preserving a uniformity of height above the water or marsh. Generally the N. of home birds are more solid than those of visitors, the former having more time at their disposal. The blackbird's is one of the heaviest, and the lesser whithroats' is of the lightest.

**Nests, Edible**, are produced in the Malay Is. and Australia by species of swifts, or swiftlets. In most of the mud-nest-building birds saliva is secreted to mix with the mud. In these swiftlets the secretory glands are so developed that the use of mud and other matter is abandoned, the nest being formed mainly

or entirely of the bird's own secretion. These N. are in great demand by the Chinese for making bird's-nest soup. From the Malay Is. millions of N. are annually imported into China.

**Nessus**, see **LOLOS**.

**Net Book Agreement**, see **BOOKSELLING**.

**Net (short) Ton**, see **METROLOGY**.

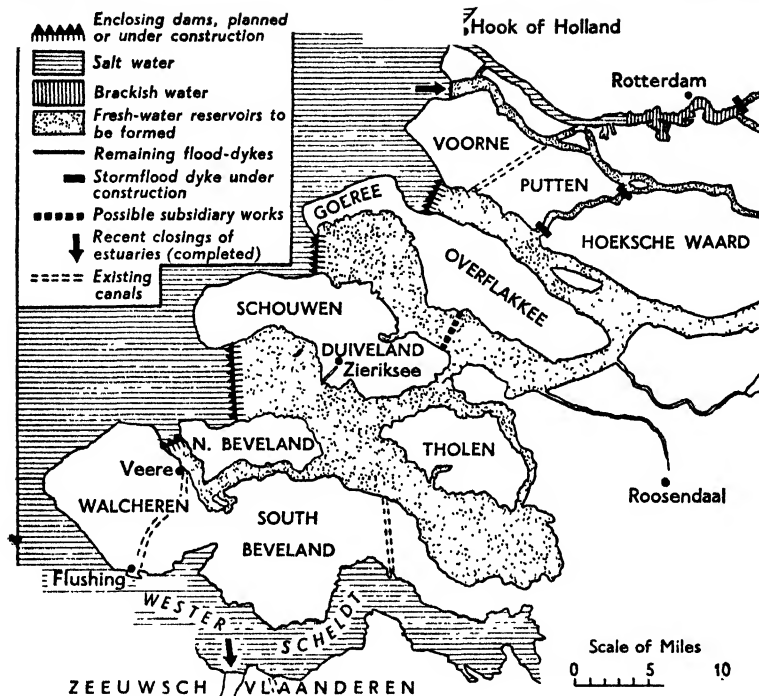
**Netball**, popular game in England and the Commonwealth for girls and women. It is played by 2 teams of 7 players each, with a leather, moulded, or rubber Association football, size 5. N. is played indoors or outdoors on a court of a hard surface, 100 ft by 50 ft. At each end and marking the centre of a shooting circle of 16 ft radius is a post, 10 ft high, holding a metal ring of 15 in. diameter, placed horizontally at the top. A team consists of 2 shooters, 3 centre court players, and 2 defenders. The shooters and their opposing defenders are the only players allowed in the circle. Started by a centre pass, taken alternately by the opposing centres, standing in the centre of the court, the ball is passed from player to player to a shooter in the circle, who then scores by throwing the ball over and through the ring. When in possession of the ball, a player may not step with it, or play it twice in any way. Infringements earn a free pass to the other side. No player may hold another, or push her, or be rough in any way. This is penalised by a free shot from the edge of the goal circle. The duration of the game is 2 halves of 20 min. each, with a half-time interval. The game is controlled by 2 umpires. The national body in England is the All England Netball Association. New rules were introduced in June 1957 and last for 3 years. See also **BASKET BALL**.

**Nâthe**, riv. of Belgium, trib. of the Rupel (q.v.). The N. is formed at Lier (q.v.) by the confluence of the Great and Little N., the main rivs. of the Kempen (Campine) region, both flowing from E. to W. The N. supplies the drinking water for the Antwerp agglomeration. The main filtering works are at Walem, 7 m. SW. of Lier.

**Nether Stowey**, vil. of Somerset, England, 8½ m. from Bridgwater, centre for the Quantock Hills (q.v.). Here Coleridge lived (1796-8) and wrote many of his best-known poems; Wordsworth moved here in 1797, and together the poets conceived the *Lyrical Ballads*. Pop. 612.

**Netherlands, The** (Dutch *Nederland*), kingdom of NW. Europe, lying between 50° 45' and 53° 36' N. lat., and 3° 22' and 7° 14' E. long., bounded on the N. and W. by the N. Sea, S. by Belgium, and E. by Germany. Its greatest length from N. to S. is 195 m., and its greatest breadth 120 m.; the land area is 13,868 sq. m., total area 15,765 sq. m. The coastline, formed by the deltas of the R.s Rhine, Waal, IJssel, and Scheldt, is very long. In 1958 the pop. amounted to some 11,070,000, making the Netherlands the most densely populated country in the world.

**Topography**. The country is very low



MAP OF THE ISLANDS OF THE PROVINCE OF ZEELAND AND SOUTH HOLLAND, SHOWING THE ENCLOSING DAMS, WHICH ARE PLANNED AND UNDER CONSTRUCTION

and flat, partly lying below sea level. It forms part of the great N. European plain, being situated at its NW. corner. Much of the NE. area (Drenthe and Groningen) is covered with wide heaths and peats, but the marshes have been drained to a great extent. Some 25 per cent of the present land has been reclaimed; the marshes formed by the deltas of the Maas, the Rhine, and the Scheldt have been turned into arable land, and vast tracts (polders, q.v.) have been reclaimed from the sea, notably the following: Beemster (in 1612), Haarlemmermeer (in 1852), Wieringermeer (in 1930), and the NE. Polder (in 1942) (qq.v.). The polders make a vital contribution to the Dutch economy. Dykes and embankments hold the sea in check and keep canals and rivers from overflowing their banks. Mechanical methods have now largely replaced the wind power formerly used in operating the pumps which regulate the water levels. The most extensive drainage schemes have been in the region of the former Zuider Zee (q.v.), now called IJsselmeer (q.v.), where reclamation in the SE. and SW. is still in progress. In

1918 an Act was passed to form a new prov. by damming and draining parts of the Zuider Zee. After completion (expected in 1980) the area of the Netherlands will be increased by 546,000 ac. of land. The Afsluitdijk (q.v.), completed in 1932, separates the IJsselmeer from the N. Sea. Locks were in use on canals in the Netherlands early in the 14th cent.; the largest lock in the world, that at IJmuiden (q.v.), on the canal connecting Amsterdam with the N. Sea, was opened by Queen Wilhelmina in 1930. The maintenance of the canals, dykes, and locks, and land drainage, are the responsibility of a special public dept called the Waterstaat; this involved the Netherlands in expenditure of considerably more than £63,000,000 for the year 1958.

*Administrative divisions and principal towns.* The Netherlands is divided into 11 provs.: N.-Holland, S.-Holland, Zeeland, Utrecht, Gelderland, Overijssel, Groningen, Friesland, Drenthe, N. Brabant, and Limburg (qq.v.). The most densely populated prov. is S.-Holland, and the least densely populated Drenthe. The official cap. and largest centre is

Amsterdam (q.v.), while The Hague (q.v.) is the seat of the gov. and Parliament. Rotterdam (q.v.) is the second largest tn in the Netherlands, and the third largest harbour in the world. Eleven other tns have pops. of over 100,000: Utrecht, Haarlem, Eindhoven, Groningen, Tilburg, Nijmegen, Arnhem, Enschede, Breda, Apeldoorn, and Hilversum (qq.v.).

**Communications.** The favourable situation of the Netherlands, half-way between the N. Cape and the straits of Gibraltar, on the most navigated sea of the world, at the mouths of excellently

A smaller port of importance is Zaandam, N. of Amsterdam, lying in the highly industrialised Zaan dist. The NE. port of Delfzijl specialises in coastal trade, notably to Scandinavia and England, as does Harlingen in the NW. from which regular services to England are maintained. The Netherlands is situated at the junction of important high roads of economic significance. England lies across the N. Sea, Belgium and France adjoin the Netherlands in the S., and Germany in the E., and Switzerland, Austria, and Czechoslovakia are also easily attainable.



*Ministry of Transport & Waterstaat, The Hague*

#### ONE OF THE STREAM-CARRYING BREACHES CAUSED BY THE FLOODS OF FEBRUARY 1953

navigable rivs. communicating with the whole of central Europe by a system of canals, makes the country a natural gateway, as well as an emporium and centre of commerce. In this way 2 seaport tns came into existence which play a very important part in the world's trade—Rotterdam and Amsterdam. The equipment of docks, quays, storehouses, loading and unloading installations in both harbours is completely adapted to world shipping.

In 1957 the mercantile marine consisted of 1485 ships with almost 4 million gross registered tons. The number of Dutch vessels navigating the Rhine is 37 per cent of the total, their tonnage being 64 per cent. The country itself is intersected by a great number of rivs. and canals, totalling about 4500 m. and linked to the water and railway transport system leading to the heart of Europe.

The system of railways is not so congested as in some other W. European countries, as a great part of the conveyance of merchandise is by inland navigation. The railway traffic being mainly passenger traffic, its speed surpasses that of neighbouring countries. During the Ger. occupation in the Second World War the Dutch railways suffered much from war operations; hardly any locomotives were left; passenger carriages and goods vans had been transported to the E., rails had been taken away as well as the overhead wires of the electric railway system. Rebuilding was started after the liberation of the country, and to-day fast and frequent services are run over 1835 m. of railway track of which 70 per cent have been electrified. The last steam locomotive was taken out of service in 1958, and electric locomotives and Diesel traction engines are now used throughout

the country. Many important international airlines use the well-equipped airport at Schiphol. The Royal Dutch Airlines (K.L.M.), the oldest airline company in the world (estab. in 1919), have regular services to all the major cities of the world.

*Industry* absorbs about 43 per cent of the working pop., a rather curious fact, taking into consideration that the country itself is short of raw materials. Iron-ore,

superphosphate and oil works. Blast furnace works are estab. in IJmuiden. Here imported ores are processed, the greater part of the iron being again exported. One of the largest tin smelting works in the world is at Arnhem. The country has over 300 shipyards. There are various breweries, margarine and soap works, as well as gin and liqueur distilleries. The great labour productivity of the Dutch people has caused industries



*Royal Netherlands Embassy*

wood, and oil must be imported from overseas, and only in the S. (Limburg) is coal obtained in considerable quantities, which cover part of the home requirements. Potential oilfields are exploited in the E. part of the country. The output of the salt-mines in the E. can completely meet the inland requirements and even allows an export of about 60 per cent of this commodity. The favourable location of the Netherlands makes it possible on the one hand for raw materials to be easily imported, and on the other hand for the industrial products to be as easily exported to all parts of the world. Consequently, coupled with the experience and skill of the workers, Dutch industry consists primarily of refining, in which the raw materials are processed into products for export, as may be exemplified in its

to be developed which demanded specialised labour, such as the diamond industry, shipbuilding and machine-building, china and earthenware manuf., as well as radio, electrical, textile, and chemical industries. The world-famous Philips incandescent lamp and radio factories are at Eindhoven.

Agriculture and farming brought into existence the important industries of canned food-stuffs, potato-flour, and strawboard. Besides the manufacturing industries, handicrafts have flourished. The fine handiwork of goldsmiths and silversmiths and other artificers, as well as the products of the furniture-maker's, glazier's, and industrial arts, find their way to both the home and foreign markets.

*Mining.* In the S. the Netherlands

operates 12 mines, all with modern equipment, 4 of them being the property of the gov. Dutch mines supply a type of coal best suited to industrial purposes. Pre-war production amounted to about 13 million metric tons per annum. Before the Second World War part of the coal destined for industrial use was exchanged abroad for household coal. After the liberation the production of coal from the mines decreased considerably, owing to various causes such as undernourishment of the miners, lack of material, enlistment of mine workers into the services, departure of foreign labourers, and labour conflicts. Through lack of shipping-space, the elimination of the Ruhr as a supplier, the decline in the output of foreign collieries, and miners' strikes abroad, the imports of coal were not sufficient to cover the requirements of the industries and private use. However, the ann. output rose from 8 million tons in 1946 to more than 12 million tons in 1956.

As a secondary by-product to coal-mining reference can be made to coke and briquette factories, chemical factories for the production of nitrogen, hydrochloric acid, chloride of lime, coal-tar products, etc. The chemical works which manuf. secondary products of coal have an important share in the industrial production of the Netherlands. Thus important industries have been estab., such as those of artificial manure, plastics, dyes, pharmaceutical products, alcohol, lubricants, soap, artificial silk, perfumes, road-covering materials, insecticides, saccharin, and disinfectants. These industries form an increasingly important part of the country's export.

**Agriculture and horticulture.** Twenty per cent of the pop. is engaged in agriculture. Because of the density of the agric. pop. Dutch agriculture had to specialise in the production of fine agric. produce, such as valuable seed crops, vegetables and fruit, bulbs and decorative plants. In addition the Netherlands has the advantage of having neighbouring countries which have developed gradually into industrial countries. Consequently their demand for agric. products has increased considerably in the course of years. The communications between the Netherlands and her neighbours are short, which makes it possible to bring the above-mentioned products fresh to foreign markets. Even air transport is used for this purpose. More than 176 million guilders' worth of flower bulbs was exported in 1955. Other main exports are eggs, butter, cheese, condensed milk and milk-powder, chocolate, beer, cigars, and cigarettes. The food and beverage industry contributes one-fourth to the country's total exports. The Netherlands is a very large consumer of fertilizer.

**Fisheries.** Fishing is one of the oldest Dutch trades which throughout the ages has made important contributions to the national income. The herring industry is intensively developed, and large quantities of herring, oysters, mussels, and fresh-

water fish are exported. A remarkable activity has developed in the exploitation of modern refrigeration ships. The whaling industry which in former cents. used to be of great importance in the Netherlands, but declined in later years, was resumed in 1946.

**Currency.** The monetary unit is the guilder, also known as the florin, divided into 100 cents. The Netherlands Bank, founded in 1814 as a private institution, was nationalised in 1948 and has the sole privilege of issuing bank-notes.

**Government and justice.** The gov. of the Netherlands is a limited and hereditary constitutional monarchy. The executive power of the State belongs exclusively to the sovereign, but is exercised by a responsible council of ministers. The legislative rests conjointly in the sovereign and States-General, or Parliament. The latter is bicameral: the first or upper chamber is composed of 50 members, elected by the prov. states, and the second chamber of 100 deputies, elected directly. There is universal suffrage and the system of election is by proportional representation. Deputies are elected for 4 years and retire in a body, whereas the first chamber is elected for 6 years, one-half retiring in rotation every 3 years. The gov. and the second chamber only may introduce new Bills, the functions of the upper chamber being restricted to approval or rejection, without power of amendment. The meetings of both chambers are public, though each may, by majority decision, form itself into a private committee. The ministers may attend the meetings of the States-General, but unless they are members they have only a deliberative vote. Alterations in the Constitution can be effected only by a Bill giving reasons, followed by dissolution of the States-General and confirmation of the Bill by a two-thirds vote of the new States-General.

Justice is administered by the High Court of the Netherlands (Court of Cassation), by 5 courts of justice (Courts of Appeal), by 19 dist. tribunals, and by 62 cantonal courts. Trial by jury is unknown. The cantonal court, which tries minor offences, is constituted of a single judge; the more serious cases are tried by the dist. tribunals, formed, generally, of 3 judges; the courts are constituted of 3 and the High Court of 5 judges. All judges are appointed for life by the sovereign (the judges of the High Court from a list prepared by the second chamber). They can be removed only by a High Court decision.

**Defence.** The pre-war army was composed partly of volunteers and partly of men drawn by lot for 5 years' service, and kept on a peace footing of nearly 400,000. The colonial army numbered nearly 40,000, of whom about 14,000 were Europeans.

The post-war army is being formed as a component of N.A.T.O. The Royal Netherlands Navy is being built up to a modern force consisting of 1 aircraft carrier, 2 heavy cruisers, 12 destroyers, and 6 submarines, supported by an



escort force of 24 ancillary vessels. The Royal Netherlands Air Force is independent of the army and has been reconstructed since the war, now forming an integral part of the air defences of N.A.T.O. countries.

**Culture and education.** Although comprising only a small percentage of the European population, the Dutch people have on the whole an honourable share in European culture, and in some instances have even made an important contribution. In New York and Paris, in the National Gallery in London as well as in the Hermitage in Moscow, the pictures of

The names of Erasmus, Hugo de Groot (Grotius), Spinoza, are well-known names in hist.; Stevinus, Huygens, Swammerdam, and Van Leeuwenhoek excellent in the technical sciences. At the many technical institutes and laboratories scientific pioneering labour has been effected and continuous research work is being done to find new methods and improve results. Since the Nobel prize was instituted it has been awarded on sev. occasions to Dutchmen: the scientists Van 't Hoff and Debye for chemistry; Lorentz, Zeeman, Van der Waals, Kamerlingh Onnes, and Zernike for physics; Einthoven and Eyk-



*Royal Netherlands Embassy*

**SKATING, THE MOST POPULAR WINTER SPORT IN THE NETHERLANDS**

Rembrandt, Frans Hals, Ruysdael, and Jan Vermeer bear witness to the glory of Dutch painting in the 17th cent. Of the painters of a later period Van Gogh, Breitner, and Mondrian have especially become famous (*see DUTCH ART and DUTCH ART MUSEUMS*). The Amsterdam Concertgebouw Orchestra is among the best orchestras in the world.

Amsterdam, having been constructed from ant times onwards according to a definite scheme, is from an architectural point of view one of the most beautiful cities in the world. The 17th-cent. buildings and the modern quarters compete in beauty and stateliness, thereby giving an excellent example of Dutch architectural taste. The numerous monumental churches all over the country, within whose walls an intensive spiritual life flourishes, also form a lasting reminiscence of the skill of Dutch architects (*see BELGIAN AND DUTCH ARCHITECTURE*).

man for medical science; and Asser for peace.

The Netherlands has a well-founded reputation for a superior system of education. It is compulsory under national law (since 1920) for students to attend school up to the age of 15. Most students, however, avail themselves of an excellent system of secondary schools. The ant univs. of Amsterdam, Leiden, Utrecht, and Groningen have been supplemented by the Rom. Catholic Univ. of Nijmegen and the Calvinist Univ. of Amsterdam; there are also 3 univs. specialising in agriculture (Wageningen), technical subjects (Delft), and economics (Rotterdam and Tilburg).

**Religion.** Entire liberty of conscience is granted to the members of all religious confessions. The royal family and a great part of the pop. belong to the Reformed Church. By the census of 1947 the adherents were: Rom. Catholics,

3,703,600; Dutch Reformed Church, 2,988,900; other Protestants, 920,200; other creeds, 371,700; no religion, 1,641,300. The N. and N.E. provs. are predominantly Protestant, whilst the great majority of the pop. in the S. provs. of Brabant and Limburg are Rom. Catholics.

*Art.* See DUTCH ART.

*Language.* Dutch is a W.-Germanic language, akin to O.E. and Low German. In the 11th cent. the anct Dutch dialects were spoken in a wider area than that now occupied by the Netherlands and Flanders, and old Dutch (or Flenish) is still to be heard among villagers in the N. of France. Early in the 15th cent. literary clubs were founded by the Rederijkers, or lovers of letters, who met together to study literature and plays. To these clubs modern Dutch owes its origin. From the 12th to the 16th cent. there was no unity either in the written or in the spoken language. A trans. of the Bible ordered by the Dutch Gov. in 1619 and carried out by the best Dutch and Flem. philologists further laid the foundation of modern Dutch. A uniform mode of writing was achieved in all provs. during the 18th cent., but uniform speaking of the 'Standard' *Netherlandish* is still one of the aims of Flem. teaching in particular. In 1946 and 1956 the spelling of Dutch was simplified after decades of discussion led by the fervid promoter, Dr Kolléwijn.

The liberty of the press brought much foreign printing to the Netherlands, and the *Gazette de Leyde*, which distributed news all over the world, was in existence 1680-1814. Illiteracy hardly ever occurs in the Netherlands. Knowledge of foreign languages is customary rather than exceptional, a fact common in small countries with export markets, and forced on the Dutch by the fact that their own language is unknown to most of their customers.

*Literature.* See DUTCH LITERATURE.

*Colonies.* Before 1939 the colonial possessions of the Netherlands included W. Indian and E. Indian ters. Since the end of the Second World War the self-governing rep. of Indonesia (q.v.) has been created. This was formerly the Dutch E. Indies; the status of W. New Guinea has, however, not yet been settled. In 1954 Netherlands *Gulana* (q.v.), comprising Surinam and the Netherlands Antilles, became autonomous.

*History.* The inhab. of the Netherlands are descendants of a people called by the Romans the Batavi, who lived on an is. between the 2 branches of the Rhine, and the Frisians who dwelt further N. In recent years there has been much skilled and thorough research into various aspects of Netherlands prehistory (see, for example, *Drentsch Praehistorische Vereniging*, the ann. reports of the Society for Terpen Research), but there is no convenient account in English.

Rom. rule lasted until the 4th cent. AD, when the Franks overran the country. Charlemagne's dominion in the 8th cent. extended to the Netherlands, and he built a palace at Nijmegen on the Waal. Upon the estab. of the feudal system the country

was divided into small sovereignties. In the year 922 Dirk became Count of Holland, and the other *Netherland provs.*, such as Namur, Hainaut, Limburg, and Zutphen, were divided between various barons and counts, autocratic rulers, owning allegiance to the dukes or earls of Lorraine, Brabant, and Flanders. Holland, Zeeland, Utrecht, Overijssel, Groningen, Drenthe, and Friesland, which were afterwards to form the United States of the Netherlands, were chiefly under the rule of the counts of Holland and the Bishop of Utrecht. It was between the 11th and 15th cents. that the cities of the Netherlands began to be important as commercial centres. In 1384 the Netherlands became the property of the Duke of Burgundy, and a little more than a cent. later were united to Spain under Charles V. The struggle for freedom and for civic and religious independence that was to last so long had already begun and came to a crisis in the reign of Philip II of Spain in the middle of the 16th cent., the immediate causes being the imposition of the Inquisition, and the maintenance of a standing army. William, Prince of Orange, known as William the Silent, who was the king's lieutenant in Holland, Zeeland, and Utrecht, became leader of the revolt against Sp. misrule, and the champion of Dutch Protestantism; and the foundation of an independent Dutch state owes more to him than to any other individual. By the capture of Brielle in 1572 Spain received her first serious reverse. In 1579 the Union of Utrecht was formed, by which the N. provs. banded themselves together to resist Spain, and in 1581 the Netherlands declared their freedom. After William's assassination, 1584, the struggle was carried on by his 2 sons, Maurice and Frederick Henry. Philip of Spain was beaten again and again at sea, and his successor was obliged to sue for a cessation of arms for 12 years. These years enabled the Dutch to recoup themselves for losses by attention to trade. The war, renewed after the armistice, was continued until 1648, when, by the treaty of Munster, Spain recognised the independence of the Netherlands.

Even while this struggle was in progress, the Dutch were making themselves masters of the sea. Their ships were in every ocean. The E. India Co., which led to the foundation of their Far E. empire, was started in 1602. Amsterdam, which instituted the first Stock Exchange, or Bourse, in 1532, had become one of the richest cities in the world. Trade brought rivals, and 2 great naval wars were fought against England in 1652-4, and again in 1664-76, in which the Eng. admirals found themselves about equally matched by Dutchmen like de Ruyter and van Tromp—the former inflicting upon England the indignity of sailing up the Medway and the Thames, destroying ships, in 1677. Then followed the war in which France and England united against the rep.; and which, but for Dutch naval power, might have ended disastrously for the Netherlands. The political struggle between the republican faction of de Witt and that

of the Prince of Orange ended with the murder of the de Witts (q.v.) and the triumph of William of Orange, who secured Eng. friendship by his marriage with Mary of York. This led to his subsequent elevation to the throne of England as William III (q.v.). English and Dutch then fought side by side in inflicting defeat upon Louis XIV of France. The treaty of Utrecht in 1713 concluded

the people that were not easy to harmonise. In 1830 the S. provs. seceded and Belgium (q.v.) was formed into a separate kingdom. The prin. events in the hist. of the kingdom of the Netherlands since 1830 are, briefly, the following.

In 1840 William I abdicated for political reasons in favour of his son, who, in 1848, granted a new and more liberal constitution to the people. The question



*National Gallery, London*

THE PEACE OF MÜNSTER, 15 MAY 1648, BY GERARD TERBURG

The scene in the Rathaus, Münster, Westphalia. Left to centre, raising the right hand, are the six delegates of the Dutch United Provinces: W. Ripperda for

Spain.

the war, and also the period of the Netherlands' greatness as a world power. The 18th cent. was one of general commercial and political decline.

At the close of the 18th cent. the Netherlands was overrun by Napoleon's troops and forced to pay tribute to France. Louis Bonaparte was made King of Holland in 1806, but resigned 4 years later when the country was attached to the Fr. Empire. The Orange family had taken refuge in England when the French invaded the Netherlands, but on the fall of Napoleon they returned, and the N. and S. provs. were formed into the kingdom of the Netherlands. This union was not satisfactory; there were temperamental and religious differences between

of the Duchy of Luxembourg (from 1815 held by the King of the Netherlands) was settled in 1867 by making it an independent state. From the middle of the 19th cent. religious issues dominated Dutch domestic politics for many years, and sev. of the modern Dutch political parties have their basis in historical religious divs. But the country prospered industrially, and a beginning was made in the field of social legislation which was considerably expanded in the 20th cent. In 1890 Queen Wilhelmina, then still a child, came to the throne, being succeeded by her daughter, Juliana, on her abdication in 1948 (*see below*). The Palace of Peace, to which many nations contributed, was opened in 1913.

It is situated at The Hague. After the Belgian secession from the joint kingdom set up in 1815, the Netherlands played little part in European hist. until the Second World War.

In the last decades of the 19th cent. there arose a vigorous movement of material and intellectual expansion, a movement which was only temporarily halted by the First World War, which naturally affected the Netherlands' overseas trade. In the inter-world-war period, new industries were still coming into existence, as, for example, the Philips electrical works at Eindhoven, the rayon industry at Breda; while, at the same time, agriculture, particularly cattle breeding, dairy farming, and horticulture, all of which industries in the previous decades had begun to make good use of new methods of organisation and scientific research, greatly prospered. The coalfields of S. Limburg, which owed their later development to the fact that during the First World War the supply of Ger. coal became restricted, were exploited with considerable success; while the great scheme for the reclamation of the Zuider Zee, so as to add a new prov. to the country, was launched in 1923. During the First World War the Netherlands remained neutral. The ex-Kaiser Wilhelm and the ex-Crown Prince found refuge at Amerongen when they fled from Germany in Nov. 1918. The ex-Kaiser settled at Doorn. Although faced with sev. problems arising out of the war, the Dutch Gov. persevered with the policy of political and social reform begun in the previous cent. Universal suffrage and proportional representation were introduced; at the same time, the principle of absolute equality with regard to the public exchequer of 'public' undenominational education and 'private' denominational education was conceded in full and incorporated in the Constitution.

*History during the Second World War.* Ger. planes bombed Dutch towns before dawn on 10 May 1940 and then land forces crossed the frontier. The Dutch had no experience of modern warfare. It was 5 generations since the last hostile troops had entered their ter. They were now to receive the rudest awakening, and their situation was aggravated by a fairly big fifth column (q.v.); for there were sev. thousand Germans living in the Netherlands and a great many belonged to the National Socialist movement led by A. A. Mussert, a Dutch engineer in charge of the roads of Utrecht. Later on 10 May numerous Ger. paratroops were landed, especially on the big aerodrome of Waalhaven. On 11 May a Ger. armoured column entered Brabant and violent fighting occurred in The Hague. In the S. of the country Ger. armoured forces now constituted the gravest menace, and on the next day they reached Dordrecht, thus cutting communications with Belgium and France. The following day the queen left on a Brit. destroyer for England and was followed by the Dutch cabinet. The Dutch troops, forced back on the Grebbe Line, retired to the Water

Line, but their reserves were fully occupied against paratroops and fifth columnists. On 14 May the Ger. armoured column reached Rotterdam and heavy fighting took place between the Germans on the S. and the Dutch on the N. of the riv. The Germans now decided to destroy the centre of Rotterdam by air bombardment in order to force the Dutch to surrender, and within 4 hrs 25,000 dwellings were destroyed and the entire centre of the city became a blazing inferno. The Dutch commander had little choice but to surrender and the Dutch troops laid down their arms, though some continued to fight for some days in Zeeland. Thus ended the brief and tragic five days' war in the Netherlands (see further under WESTERN FRONT IN SECOND WORLD WAR). The Ger. vanguard entered Amsterdam on the 14th. To make a good impression on the Dutch, Hitler appointed Seyss-Inquart, an Austrian, to be Ger. Commissioner for the occupied Netherlands. As in Belgium so in the Netherlands, the Germans tried first to win the people by propaganda and cajolery. They announced that the New Order would leave things as much as possible in the hands of the Dutch themselves. The Nazification of the Netherlands was to be organised so gradually that the Dutch would be hardly aware of the process. A council of Secretaries-General was to be the nominal gov., but the real gov. consisted of the Reichs-commissioner and his assistants, while a group of Ger. officers were appointed to supervise Dutch prov. and municipal life. The Ger. order was characterised by its financial organisation under which Berlin was the centre of a European system of multilateral clearing, which made it easy for the Reich to sap the economic resources of the countries occupied by their troops. Dutch factories which fitted into the Ger. war-machine had orders forced upon them. The Dutch wharves were used for constructing Ger. U-boats. Dutch engineering industry was soon working to full capacity on Ger. army orders. The Netherlands was soon crushed under its financial burdens and the standard of living rapidly declined. Produce was carried away into Germany. Supplies, whether ample or scarce, were in the first place destined for consumption by the Ger. troops. Everything was done by Seyss-Inquart to impregnate Dutch institutions with the 'Nordic culture.' The fact that the Dutch people proved to be immune against Nazi cultural infiltration was partly due to the Churches, which developed into strongholds of patriotism. But if the Germans were able to close all schools and univs. and to fill the papers with propaganda and broadcast Nazi speeches all day, they were not able to turn the Dutch themselves into Nazis. Queen Wilhelmina remained more than ever the symbol of the will to resistance. There was active resistance too, and the Ger. military commander found himself forced to issue warnings against all kinds of sabotage.

The Netherlands did not again figure in

land operations until late in 1944 when the Anglo-Amer. chiefs of staff decided to use the newly constituted Brit. and Amer. Airborne Divs. on 17 Sept., to assist in seizing the Rhine crossings at Nijmegen and Arnhem after the rapid advance by the land armies. It seemed probable that through rapidity of exploitation both the Siegfried Line (q.v.) and the Rhine might be crossed and strong bridgeheads estab. before the Germans could recover sufficiently to make a definite stand in the Arnhem area. The first landings of the airborne troops were made on 17 Sept. and reinforcements followed on successive days. There was confused and heavy fighting in the area between Nijmegen

of April and the sea was reached on 15 April. By the 21st the whole area, apart from a small tip in the NE., was cleared as far as Harderwijk and the E. shore of the IJsselmeer. To the W. the IJssel R. line was stubbornly defended at Deventer and Zutphen, but the former in fell on 10 April. In the S. part, the Canadian First Corps attacked from Nijmegen, and Arnhem was taken on the 15th. The Germans now withdrew into 'Fortress Holland' behind the Grebbe and New Water lines, protected by floods, beyond which no further allied advance was made in this sector. It was felt by Montgomery that an advance into the Netherlands would occasion great additional suffering for that



*Netherlands National Tourist Office*

**HORTICULTURE IN THE NETHERLANDS: NARCISSUS FIELDS AT LISSE**

and Arnhem during the ensuing few days, and the position of the First Airborne Div. became so precarious that on 25 Sept. orders were given for the withdrawal of all forces across the Lower Rhine (for full details see WESTERN FRONT IN SECOND WORLD WAR). After this the Allies turned their attention to opening up Antwerp. By 30 Sept. the whole of S. Beveland had been cleared by Brit. and Canadian forces and the troops then continued their attack against the causeway connecting the S. Beveland Isthmus with Walcheren. Against Walcheren the Canadians attacked from the W., while amphibious forces, landed (1 Nov.) at both Westkapelle and Vlissingen, converged on the strongpoints of the is. By 9 Nov. the stiff resistance had ceased and some 10,000 troops had been captured. After this the line at Nijmegen westward to the sea was held by the Canadians so that, after the Rhine had been crossed into Germany, a thrust to the Baltic would isolate the Ger. forces in the Netherlands. Resistance in N. Holland collapsed in the first week

unhappy country and that the quickest and most economical way to free the country was to complete the destruction of the enemy forces elsewhere. In fact, the complete liberation of the country soon followed on the final collapse of all Ger. resistance in Europe, though during the last weeks of the Ger. occupation the Dutch suffered appallingly from shortages of food, etc.

The task of reconstruction was begun immediately after liberation. By the spring of 1947 the rebuilding of all the main road bridges had been completed either with permanent or temporary structures and nearly all the railway bridges had been replaced. The main communications having been re-established and the most important harbour installations repaired, constructional energies were next directed to the dual task of house building and rehabilitating the flooded agric. areas (more than 8 per cent of the agric. land was flooded and more than 2 per cent laid waste by Ger. fortified zones, minefields, and aerodromes), much

of the latter task being achieved by the end of 1947. The serious housing situation in which the country found itself after the war is indicated by the fact that nearly one-fourth of the total number of dwellings were damaged and nearly 3.75 per cent totally destroyed. Rebuilding took place very rapidly, priority being given to the erection of flats and houses; in places such as Arnhem and Rotterdam, where devastation was on a colossal scale, full advantage was taken of the unique opportunities offered of replanning whole town centres on the most modern lines. Side by side with material reconstruction the post-war govts. pursued a full programme of social improvements.

On 25 Jan. 1945 the first special tribunal for the investigation of collaboration charges was opened at 's Hertogenbosch. Over 90,000 persons were detained in the course of 1945. On 12 Dec. the leader of the Dutch Nazis, Mussert, was sentenced to death by a special court at The Hague. In April 1949 minor frontier modifications in the Netherlands' favour were made at points on the Dutch-Ger. frontier.

Since the war the Netherlands has been governed by a series of coalitions, often composed of interests which conflict on a number of important topics. In 1956 the country was without a gov. for sev. weeks while efforts to form a stable coalition were made by the leaders of various parties. Dutch political parties continue in many cases to have distinctive religious affiliations, but a notable feature of the post-war Netherlands has been the increase in the power of the Socialist party, which appeals to both Protestants and Catholics.

The question dominating Dutch politics in the immediate post-war years was the Indonesian problem. After sev. years of abortive negotiation and intermittent, but occasionally bitter, fighting, the United States of Indonesia was finally estab. (1950), and A. Soekarno (q.v.) elected first president of the new rep. The fighting stopped, and the transfer of sovereignty to the new state was approved by the Dutch and Indonesian parliaments. The question of Netherlands New Guinea remained unsettled, however, and continues (1958) to embitter Dutch-Indonesian relations.

The Netherlands is a member of Benelux and of N.A.T.O. Since the end of the Second World War her industrial resources have been revived and expanded; in Feb. 1953 disastrous sea floods affected large areas of the country, causing over 1800 deaths and extensive damage to land and property. Since then reclamation work, both on the regions flooded in 1953 and on other areas already destined for reclamation, has proceeded swiftly, continuing the vast scheme which was begun in 1923.

On the occasion of the national celebrations in honour of the fiftieth year of her reign and of her sixty-eighth birthday, which fell on 31 Aug. 1948, Queen Wilhelmina on 30 Aug. resumed for a period of a week the royal authority which she had relinquished the previous May in

favour of her daughter, Princess Juliana, who had since then acted as Princess Regent. On 4 Sept. Queen Wilhelmina formally signed an Act of Abdication at the Royal Palace, Amsterdam, in which she declared that she had 'completely, voluntarily, and irrevocably' abdicated all her royal dignities and prerogatives and transferred them to her daughter, Queen Juliana, the 5th monarch of the Netherlands and of the Royal House of Orange-Nassau, who was formally inaugurated on 6 Sept. in the Nieuwe Kerk in Amsterdam. Queen Wilhelmina after abdication took the title of Princess of the Netherlands, living in complete retirement.

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**Netherlands Guiana, or Surinam**, semi-autonomous Dutch dependency, on the N. coast of S. America between lat. 2° and 6° N. and long. 53° 50' and 58° 20' E., has an area of 55,143 sq. m. and a pop. of 238,000. It is bounded on the E. by the R. Maroni (or Marowijne) which separates it from Fr. Guiana, on the W. by the Courantyne (or Corantijn), which divides it from Brit. Guiana, and on the S. by dense forests bordering on Brazil. Under the new Netherlands Constitution of Dec. 1954 there is an elected legislative council of 21; the governor appoints a ministry of 9 and advisory council of 5, in addition, and 7 district commissioners (Paramaribo, Surinam, Commewijne, Saramacca, Nickerie, Coronie, and Marowijne).

**Communications.** The general direction of the rvs. in the interior is from S. to N., but near the coast most flow in a westerly

direction, because the ocean currents sweeping W. from the Amazon have deposited silt at their mouths and thereby considerably enlarged the original land area. A few miles from the coast there is a narrow zone of savannahs, and beyond, drained in part by the upper reaches of the Maroni and the Nickerie, the unrelieved jungle stretching to the frontier of Brazil. The rivers are much used for transport, especially in the Paramaribo region, connecting Moengo, Paramaribo, Marienburg, and Alliance. There are 400 km. of main roads and 83 m. of railways. Four shipping companies connect with U.S.A., France, the Netherlands, and the Caribbean coast and is. The airport at Zandery, 30 m. S. of Paramaribo, was built by U.S. forces in the Second World War, and is now in full civilian international use. Much of this jungle is uninhabited or only sparsely populated by nomadic Indians—who hunt, fish, and grow manioc and cassava—or by Bush Negroes.

Seven-eighths of the pop. of N. G. live in the narrow coastal belt into which almost all the agriculture and industry of the colony is concentrated: of these about one-third live in the cap., Paramaribo. The Amerindian pop. numbers only 3700, and the Bush Negroes are increasing and now number nearly 22,000. The Saramaccans form the largest tribe, numbering twice as many as the others together. They live in the region between the Surinam R. at Kabaletation and its confluence with the Gran Rio and Pikien Rio. The Aucaners of the upper Commewijne and Marouï Rs. are the only other important tribe. Their present civilisation is said by anthropologists to be practically identical with that of Africa in the 17th cent. Both the Saramaccans and Aucaners let their hair grow long and braid it in fanciful designs. The Bush Negroes live by hunting, fishing, and agriculture, and hunt with bows and arrows unless they can procure firearms. Their crops include yams, bitter cassava, peanuts, maize, dry rice, and a little sugar-cane. A serious crop pest is the umbrella or leaf-cutting ant which attacks newly planted fields, and old too if adjacent to the new. The Guiana Indians live in much the same state as they did when the country was first explored. The prin. agric. industries are sugar, rice, and coconuts. Cattle-breeding could be much more developed, as could the timber trade. Liberian coffee and cacao are also cultivated. Gold is found in the interior, and the forests yield balata (116,000 kilos in 1954) among other products. Bauxite (3,421,000 kilos in 1954) is also an important product. The ter.'s main trade is with the U.S.A. and the Netherlands. The plantations lie along the lower courses of the Surinam and Saramacca and also in the low-lying coastal regions, and the chief settlements are among these plantations. These settlements are inhabited by Javanese, Chinese, Negroes, and about 3000 whites. The total pop. is about 238,000, the main groups being: 3600 Europeans, 99,000

Creoles, 82,000 Hindus, 47,000 Indonesians, 4200 Chinese, and 2900 others. They all keep their characteristic faiths, and there is complete religious freedom. The average temp. from Dec. to Mar. is 80° F. The nights are cool and health conditions are favourable owing to the prevailing E. wind.

The gov. of N. G. is administered by a governor and an advisory council, all the members of which are nominated by the Queen of the Netherlands. The legislative body is called the States, whose members sit for 6 years. Paramaribo (q.v.) is the chief tn. Of the smaller tns Nieuw Amsterdam, close to the cap., is the administrative centre of the Commewijne dist. Nieuw Nickerie, second tn of N. G., is the centre of an important rice-growing dist. largely populated by Javanese and Indians. Coronie is surrounded by great swamps, but a new road to Paramaribo has lessened its isolation. Albina is a little frontier tn 18 m. above the mouth of the Maroni R. The first attempt at the settlement of N. G. was made in 1630 by Capt. Marshall, an Englishman. In 1644 some Dutch and Portuguese Jews from Brazil introduced sugar cultivation; but it was not until 1650 that a permanent settlement was effected by Francis, Lord Willoughby of Parham (see BARBADOS). In 1666 the colony capitulated to the Dutch, and by the Peace of Breda in 1667 it was ceded to the Netherlands in exchange for New Amsterdam, now New York, which thus became a Brit. possession. Thereafter Surinam was twice in the possession of England, from 1799 to 1802, and from 1804 to 1816, when it was finally landed back to the Dutch. See W. H. Brett, *The Indian Tribes of Guiana: their Condition and Habits*, 1868; G. Palgrave, *Dutch Guiana*, 1876; W. E. Roth, *An Inquiry into the Animism and Folklore of the Guiana Indians*; J. Rodway, *Guiana. British, Dutch, and French*, 1921; M. J. and F. S. Herskovits, *Rebel Destiny: Among the Bush Negroes of Dutch Guiana*, 1934; P. H. Hiss, *Netherlands America*, 1943; L. L. E. Rens, *Historical and Social Background of Surinam Negro-English*, 1953; International Bank, *Surinam: Recommendations for a 10-year Development Programme*, 1953.

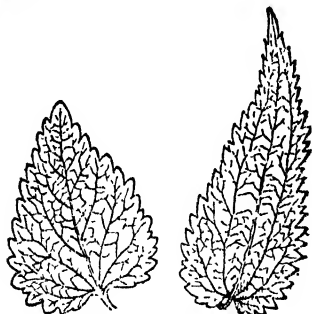
Néthou, Pic de, see PYRENEES.

Netley, vil. in Hants, England, 3 m. SE. of Southampton. There are ruins of a Cistercian abbey (Early English and Decorated) dating back to the early 13th cent. The Royal Victoria (military) Hospital was opened after the Crimean War.

Nets are fabrics in which the threads cross each other at right angles, leaving a comparatively large open space between them. Netting differs essentially from weaving in that the threads are knotted at the intersections. The open spaces in N. are called meshes, and these correspond in size with an instrument used in net-making, consisting of a flat piece of wood or other hard substance, usually about the shape and size of a common paper-knife. In addition to this a peculiar kind of

needle is used, upon which a large quantity of the thread is placed, by winding it from end to end between the forked extremities. The art of net-making has been practised from the earliest times by the most savage as well as the most civilised nations. It is easy to see that the human race learned the value of this art from noticing how frequently land and water animals became entangled in the shrubs and weeds through which they attempted to pass. There are many illustrations of the uses of N. in the bas-reliefs of Assyria, Greece, and Rome, and in the mural paintings of Egypt. Until recently N. have always been made by hand. Hemp is the chief material for net-making. After the net comes from the loom it goes to the finishers, who, by hand, make the addition of a kind of selvage, consisting of sev. thicknesses of twine, to give strength to the edges. A great variety of N. are in use amongst fishermen, but the prin. are the seine, trawl, and drift N. See also FISHERIES.

**Netsuke**, Jap. ornament in the form of a toggle, usually made of wood or ivory, often carved with great inventiveness, from which hangs a cord to carry a tobacco-box, a medicine-case, or other small objects. The word is written with 2 Jap. characters, meaning literally 'root' or 'bottom' and 'attach' or 'meet' respectively. The purpose of the N. is to hold the article in question suspended from the girdle. See E. Ryerson, *The Netsuke of Japan*, 1958.



Left: Leaf of Dead-nettle.  
Right: Leaf of Stinging-nettle.

**Nettle**, name given to a number of ann. and perennial herbs, characterised by stinging hairs on leaves and stems. The great N. (*Urtica dioica*) is a perennial with small green flowers in long, branched clusters. The tender tops are sometimes boiled and eaten as a vegetable in spring. Its fibre yields a yarn, said to be superior to jute and hemp, though inferior to flax, and is valuable for damasks and brocades. Some species are used in the manuf. of ropes and textiles. The small N. (*U. urens*) is an annual, with flowers in a short, seldom branched cluster. *U. pilulifera*,

the Rom. N., probably was introduced, and is very rare, possibly extinct. Dead-N. (q.v.) is of a different species, even though the white dead-N. (*Lamium album*) resembles in appearance the stinging N.

**Nettlerash**, see URTICARIA.

**Nettuno**, It. port in Lazio (q.v.), on the Tyrrhenian Sea, 33 m. S. by E. of Rome (q.v.), and 2 m. NE. of Anzio. An important landing was made here by the Allies during the Second World War (see ANZIO). Pop. (tn) 12,100; (com.) 15,400.

**Netum**, see NOTO.

**Network Analyser**, small-scale model of an electric supply network consisting of generator elements, variable resistance and reactance line elements, load elements with transformers and resistance and reactance units, which can be combined in various ways by a plug-in system to simulate various networks, projected or actually operating. By means of a set of meters, the behaviour of the network under different conditions can be studied, the effects of faults or short circuits at any point, of load variations and generator regulation, on any section of the network can be measured directly. The simpler N. A.s work on d.c. only, the modern type use h.f. a.c. (500 c/s) to obtain high reactance values with low inductance; the generators may be 10–20 V., 10 m. A. electronic oscillators.

**Neu Mecklenburg**, former name of New Ireland (q.v.).

**Neubrandenburg**: 1. Dist. (*Besirk*) of the Ger. Democratic Rep. (E. Germany), bounded on the N. by Rostock, on the E. by the Polish prov. of Szczecin, on the S. by Frankfurt-an-der-Oder and Potsdam, and on the W. by Schwerin (qq.v.). It was formerly part of Mecklenburg (q.v.). Area 4195 sq. m.; pop. 635,000.

2. Ger. tn, cap. of the dist. of N., on the R. Tollense, 70 m. N. of Berlin. It was the cap. (1359–1471) of the duchy of Mecklenburg-Stargard. There was much damage during the Second World War. It has an 18th-cent. palace, and medieval churches and walls. There are engineering, chemical, and paper industries. Pop. 22,000.

**Neuburg**, Ger. tn in the *Land of Bavaria* (q.v.), on the Danube (q.v.), 46 m. NNW. of Munich (q.v.). It has ant. fortifications, and many fine old buildings. Pop. 15,000.

**Neuchâtel** (Ger. Neuenburg): 1. Canton in the W. of Switzerland, between Lake N. and the Fr. frontier. N. lies in the midst of the Jura Mts, 4 chains of which, running from NE. to SW., traverse the canton. The lake of N. is 25 m. long, and from 3 to 5½ m. wide. It is 1420 ft above the sea and has a depth of 400 or 500 ft. The natural products are iron ores, coal, asphalt, fruit, including grapes—from which good red and white wines are made—timber and corn. The rearing of cattle constitutes an important branch of industry, and large quantities of cheese are exported; but the speciality of the canton is watch-making and the chief centres of this industry are La Chaux-de-Fonds and Le Locle. Area 309 sq. m.;



pop. (1955) 136,600 Fr.-speaking Protestants. N. joined the Swiss Confederation in 1815.

2. Cap. of the above canton, occupying a magnificent site on the NW. shore of the lake of N. 25 m. WNW. of Bern, and is noted for its many charitable institutions and for the beauty of its charmingly situated environs. Its anc. castle, an abbey church dating from the 12th and 15th cents. (now Protestant), and its art museum are of interest. The tn is an educational centre and has a famous univ. established from the academy in 1909. It is the seat of the watch-making industry, and also manufs. jewellery and condensed milk. Pop. (1955) 30,100.

'Neue Zürcher Zeitung,' oldest Zürich daily newspaper (circulation 72,000), founded in 1780, and since 1894 pub. 3 times each week-day. The leading Swiss paper, it represents Swiss liberalism, and has regular supplements on technical matters, art and literature, sport, travel, and automobiles, and enlarged week-end eds. There is also a special daily issue for abroad, with a circulation of 12,000 copies.

Neuenahr, see APOLLINARIS WATER.

Neuenkirchen, see NEUNKIRCHEN.

Neuf-Brisach, see BRISACH.

Neufahrwasser, see GDAŃSK.

Neufchâteau, Fr. tn, cap. of an arron., in the dept. of Vosges, on the Meuse. It has breweries. Pop. 4100.

Neufchâtel, see NEUCHÂTEL.

Neufchâtel, or Neufchâtel-en-Bray, Fr. tn in the dept. of Seine-Inférieure, on the Bèthune, 50 m. NE. of Rouen. It is noted for its cheese and cider, and is a centre for livestock and poultry. Pop. 3800.

Neuhäusel, see NOVÉ ZÁMKY.

Neuhoff, Theodor von (c. 1690-1756), Ger. adventurer. He served in the army of Charles XII of Sweden, and was an ardent supporter of the Jacobite cause. His fame rests upon his helping the Corsicans against the Genoese, and ultimately ascending the throne of Corsica as Theodor I (1736). He was, however, forced to abdicate soon afterwards.

Neuilly-sur-Seine, Fr. tn in the dept. of Seine, a W. suburb of Paris, near the Bois de Boulogne (q.v.). Part of a former royal château remains, and there are sev. other châteaux, in one of which peace was signed between the Allies and Bulgaria in 1919. N. is a residential dist., and has numerous clinics and convalescent homes. Pop. 68,100.

Neukölln (formerly Rixdorf), suburb of SE. Berlin (q.v.), Germany, on the Teltow canal, 5 m. from the city centre. It has workers' residences, and textile and engineering industries.

Neumann, Alfred (1895- ), Ger. novelist and dramatist, b. Lautenburg, Prussia. He was reader for Georg Müller, Munich publishers. He is known chiefly for his many historical novels, in which he uses the lessons of the past to illustrate present-day political situations and problems. Literary recognition and the Kleist prize came with *Der Teufel*, 1926, on the despotism of Louis XI. *Rebellen* (trans. as *The Rebels*), 1928, and its sequel

*Guerra*, 1929, had the Carbonari and It. independence respectively as their theme. *Der Held*, 1930, is founded on the murder of Rathenau in 1922. Historical portrayal is again the background of *Königin Christine von Schweden*, 1926. *Narrenspiegel*, 1932, departs from the unalloyed historic manner by reason of its coarse Rabelaisian humour. N.'s plays include *Königsmaske*, 1928, *Frauenschuß*, 1929, and *Ilans Danieli*, 1931. With the Nazis' advent to power N. went to America, writing there *Neuer Caesar*, 1934, and *Kaiserreich*, 1936. He has also written a biography of Musset, 1925, novelettes, short stories, trans. of Musset, Molière, and Lamartine, essays, and poems.

Neumann, Balthasar (1687-1753), Ger. architect, b. Eger. Exponent of the baroque style. Among the buildings he designed were the archiepiscopal residence at Würzburg; the schloss at Brühl; and churches at Neresheim, Mainz, and Vierzehnheiligen.

Neumann, Teresa (1898- ), Bavarian stigmatic, b. Konnersreuth. She received the marks of the 5 wounds of Christ during Lent 1926, experiencing every Friday since then a vision of His Passion. She is visited by pilgrims from all parts of the world. See Father Pacificus, *Story of Teresa Neumann*, 1950, and Hilda Graef, *Difficulties in the Case of Teresa Neumann*, 1950.

See also STIGMATISATION.

Neumann's Law, see INDUCTION, ELECTRO-MAGNETIC.

Neumünster (anc. Wippendorf), Ger. tn in the Land of Schleswig-Holstein (q.v.), 18 m. SSW. of Kiel (q.v.). It is an anc. tn, but to-day is completely modern in appearance. During the Second World War it was very severely damaged. There are railway workshops, and textile, leather, iron, paper, machinery, and stone industries. Pop. 75,000.

Neunkirchen: 1. Tn of the Saarland (q.v.), on the Blies, 12 m. NE. of Saarbrücken (q.v.). It is a coal-mining centre, and has important iron and steel industries. Pop. 43,000.

2. (or Neuenkirchen) Austrian tn in the prov. of Lower Austria, on the Schwarza. It has iron and textile industries. Pop. 10,600.

Neuquén, prov. of Argentina, between the Colorado and Limay R.s., with an area of 36,429 sq. m. and a pop. of 190,900. The surface on the whole is mountainous, and the prin. riv. is the N. The celebrated Lake District ski-ground is in this prov. The cap., also named N., is situated in NW. Patagonia on the Roca railway, 700 m. from Buenos Aires. Near at hand is the great Rio Negro barrage. Pop. 8500.

Neuralgia (Gk *neuron*, nerve; *algos*, pain), medical term for an intermittent pain in the area of distribution of a sensory nerve or nerves. It is a symptom, not a disease. It is usually caused by inflammation (neuritis) or pressure on the nerve or nerve root, or to the exposure of the nerve endings to irritation, as in toothache or sinus infection. N. of certain nerves occurs so frequently that the

symptoms have in course of time been labelled as disease entities. Thus *Sciatica* is a N. of the sciatic nerve; *intercostal N.* N. of the intercostal nerves; *tic douloureux*, N. of the trigeminal or fifth cranial nerve supplying the side of the face and tongue. *Treatment* consists in removing the cause if possible, analgesics and, sometimes, the surgical measure of injecting nerve ganglia or roots with alcohol or local anaesthetics.

**Neurasthenia** (Gk *neuron*, nerve; *asthenia*, weakness) is a comprehensive term which was formerly very loosely applied to a large number of psychogenic disorders characterised by nervous exhaustion, difficulty in concentrating attention, easy fatigability, and disinclination for bodily effort, faulty memory, sensation of pressure on the head, spinal irritability, insomnia, disturbance of digestive functions (including constipation, sense of fullness after eating, and flatulent dyspepsia), disturbance of sexual functions (e.g. amenorrhoea and dysmenorrhoea in women, and impotence and spermatorrhoea in men), disturbances of the special senses (involving head noises, blurring of vision, etc.).

The outlook upon N. has completely changed of late years. It is now recognised that many of the conditions which were formerly labelled N. were either anxiety states or hysteria syndromes, and the term is now reserved for conditions presenting a clinical picture in which fatigue is the sole or at least the leading symptom. The result is that, compared with formerly, the term is now rarely used. Views regarding its aetiology have also undergone a complete change. It is increasingly realised that though, in a number of cases, the onset of N. corresponds to a period of worry and overwork, or to a shock, these are merely the occasion, not the cause, of the illness. The neurasthenic suffers from an arrest of psycho-sexual development; remaining at a level of preoccupation with himself and his interests, unable to adjust himself to the need of open and outward manifestation which is essential to success and happiness. He suffers from a fixation at an auto-erotic level of development which hinders him from the activities which win social esteem and self-respect. This state is reflected in the feeling of guilt which plays an important role in the psychological make-up of the neurasthenic. The modern concept of its aetiology has inevitably led to a readjustment in the views formerly held regarding its treatment. On the assumption that overwork was the prin. cause and that the symptoms were therefore due, almost directly and wholly to fatigue, treatment was formerly aimed at enforcing absolute rest. In the Weir-Mitchell treatment, for example, in order to prevent the slightest expenditure of unnecessary energy, the patients were not allowed even to feed themselves. While the importance of suitable diet and adequate rest in hygienic surroundings is, of course, still recognised, psychotherapy is now regarded as essential if a complete

cure is to be achieved. See G. Ballet, *Neurasthenia*, 1911; R. Vittoz, *Treatment of Neurasthenia by Means of Brain Control*, 1928; D. M. Armistage, *Challenge to Neurasthenia*, 1935; D. K. Henderson and R. D. Gillespie, *A Text-book of Psychiatry* (7th ed.), 1950. See also PSYCHASTHENIA.

**Neurath, Baron Konstantin von** (1873–1956), Ger. politician and diplomat, b. Tübingen and educ. in Berlin. He was councillor in Constantinople (1914), minister to Denmark (1919), ambas. to Italy (1922), and to Britain (1931). He became Ger. minister of foreign affairs (1932–8), and was president of the privy council from 1938. N. became notorious as Reich 'protector' for Bohemia and Moravia (1939–41). Later he retained formal relationship with the Nazi gov. as minister without portfolio. N. advised Hitler to withdraw from the disarmament conference under the League of Nations and played an important part in Hitler's decision to reoccupy the Rhineland. As 'protector' of Bohemia and Moravia, he set up an administration similar to that in Germany. He abolished political parties there and trade unions, introduced Nazi racial laws, and compelled Czech industry to work for the Ger. war effort. But his efforts on behalf of Czech students imprisoned after the Ger. occupation, and his policy generally, were considered too lenient by Hitler, and he was recalled in 1941. He was tried at Nuremberg as a war criminal in 1946, and sentenced to a 15-year term of imprisonment, but released before his death.

**Neuritis**, inflammation of a nerve, may be localised or multiple. In localised N., caused by injury, cold, pressure, etc., there is considerable pain along the course of the nerve. Multiple N. is the simultaneous inflammation of nerve trunks, often symmetrically situated on both sides of the body. N. may result from the toxins of micro-organisms, e.g. those of diphtheria, influenza, syphilis, malaria, smallpox, dysentery, etc. Poisoning by alcohol, arsenic, lead, copper, phosphorus, carbon monoxide, and aniline compounds, or auto-intoxication through diabetes or beri-beri (q.v.), may also be exciting causes of N. The symptoms vary according to the cause. There is numbness, loss of power, and atrophy of muscle in certain parts. In milder cases the atrophy disappears, but in other cases there may be ultimate paralysis of the parts. At first the superficial reflexes may be exaggerated, but are later lost as a rule. Treatment deals, in the first instance, with the relief of pain. The only cure, however, is the elimination of the cause.

**Neurosis**, see ANXIETY STATES; OR-SESSIONAL PSYCHONEUROSES; PSYCHONEUROSIS.

**Neuruppin**, Ger. tn in the dist. of Potsdam, on the W. shore of Lake Ruppiner, 38 m. N. by W. of Potsdam (q.v.). It was the cap. of Ruppiner co. until the 16th cent. It is a health and sporting resort, and has printing and chemical industries. Pop. 25,000.

**Neusalz**, see NOWA SÓL.

**Neusatz**, Yugoslavia, *see* NOVI SAD.  
**Neusiedlersee** (Hungarian *Fertő Tó*), lake of central Europe, mainly in Burgenland (q.v.), Austria, but partly also in Győr-Sopron co., NW. Hungary. It is slightly salt, is shallow and reed-grown, and its area (up to 130 sq. m.) varies. In the E. it is connected with an extensive marsh called the *Hanság*, now being drained.

**Neusohl**, *see* BĀSKÁ BYSTRICA.

**Neuss** (Rom. *Novaesium*), Ger. tn in the *Land* of N. Rhine-Westphalia (q.v.), on the Rhine opposite Düsseldorf (q.v.), with which it is connected by bridge. It has a fine 13th-cent. church, and there are remains of a Rom. camp. There are iron, paper, and foodstuff industries. Pop. 65,000.

**Neustadt**: 1. Tn in Poznań prov., Poland, *see* LWÓWEK.

2. Tn in Gdańsk prov., Poland, *see* WEJHEROWO.

3. Baltic seaport in Germany, in the *Land* of Schleswig-Holstein (q.v.), on Lübeck Bay. 31 m. SE. by E. of Kiel (q.v.). During the Second World War it was an important U-boat (*see* SUBMARINES) base, and is now a coastguard H.Q. Pop. 15,000.

4. Ger. tn in the *Land* of Bavaria (q.v.), 8 m. NE. of Coburg (q.v.). Pop. 7000.

**Neustadt-an-der-Haardt**, Ger. tn in the *Land* of Rhineland-Palatinate (q.v.), at the foot of the Haardtgebirge, 44 m. S. by W. of Mainz (q.v.). It has a notable 14th-cent. church, and other old buildings, and is an important centre of the wine trade. Pop. 31,000.

**Neustettin**, *see* SZCZECINEK.

**Neustrelitz**, Ger. tn in the dist. of Neubrandenburg, 15 m. SW. by S. of Neubrandenburg (q.v.). It was formerly the cap. of the Grand Duchy of Mecklenburg-Strelitz (*see* MECKLENBURG). It was very severely damaged during the Second World War. There is a palace, and there are engineering industries. Pop. 25,000.

**Neustria**, name given to the W. div. of the Frankish kingdom to distinguish it from the E. div., Austrasia (q.v.). The two became merged in the 8th cent.

**Neutra**, **Richard** (1892- ), Austro-Amer. architect. b. Vienna, was trained there; returned there in 1919 after war service; worked for a short time under E. Mendelsohn (q.v.) in Berlin; and emigrated to the U.S.A. in 1923. He began practice at Los Angeles in 1926. His remarkably original designs include the Military Academy at Los Angeles, and many houses, hospitals, and schools in California, Texas, and Puerto Rico.

**Neutra**, *see* NITRA.

**Neutral Point**, the common terminal of the phase windings of a polyphase machine, transformer, or network. It is usually earthed, directly or through a resistance or reactance.

**Neutralisation**, **Heat of**, *see* HEAT OF FORMATION.

**Neutrality**, in international law (q.v.) the condition of states which stand aloof from a war between other states, the essential feature of the condition being this

negative attitude and not the positive attitude of offering impartial treatment to the adversaries. The word itself is of recent origin, as in the olden times when states were at war, all other states concerned were considered as on one side or the other. Late in the 17th cent. it was recognised that neutral states should give no assistance to belligerents, but such points as to what extent neutrals could prevent their ter. being used for hostile purposes, etc., were by no means clearly understood. The development of opinion gradually imposed stricter obligations upon neutral powers; e.g. it was once common for neutrals to supply troops to one of two belligerents under a previous treaty, and the practice was followed as late as 1826. The Hague Conventions of 1907 contain no specific prohibition of the supply of troops in land warfare, though the practice became extinct until the Sp. Civil War, 1936, when Germany and Italy, though nominally neutrals, sent troops to aid the insurgents against the republicans. In regard to naval warfare, it was agreed that the supply, in any manner, directly or indirectly, of warships, supplies, or war material of any kind by a neutral power to a belligerent power be forbidden. But a neutral is not bound to prevent the export or transit for either belligerent of arms, munitions of war, or in general of anything which could be of use to an army or fleet. In matters which do not relate to war a neutral must not refuse to one belligerent any advantage which she grants to the other. The question in regard to N. which has caused more controversy than any other is that respecting neutral goods on belligerent vessels, and vice versa. It was at first held that the ownership of the goods on board the vessels was the only thing to be considered; thus merchandise belonging to the enemy was seized on a neutral ship, but neutral merchandise seized under a hostile flag was restored. This system led to so much inconvenience and irritation that the opposite principle was adopted, and neutral merchandise under a hostile flag was seized, and hostile merchandise was safe under a neutral flag. *See on this* CONTRABAND; DECLARATION OF LONDON; DECLARATION OF PARIS.

It is a violation of N. for a neutral state to make a money loan to a belligerent, but it is more open to doubt in cases where the loan issues from neutral individuals. Though neutral states are not bound to prevent their subjects from lending money to belligerents in the ordinary way of business, they have, in circumstances of grave difficulty, deemed it right to impose restrictions, as in the First World War, when the U.S.A. declared that loans from Amer. bankers to any foreign nation which was at war were inconsistent with the true spirit of N. This declaration was deprecated in America, but the secretary of state adhered to it. As to the use of neutral ter. for fitting out warships, the *locus classicus* is the declaration of Jefferson, who held that it was incompatible with the sovereignty of the U.S.A. and

tended to interrupt the peace and good understanding between America and Great Britain to allow Fr. ships to be fitted out in Amer. ports; and the soundness of this opinion has never been seriously questioned. The dividing line between acts which the neutral is bound to restrain and those in which its subjects can engage at their peril is not always easy to decide. The distinction came into prominence in the famous *Alabama* case, where ultimately it was agreed, by the treaty of Washington, 1871, to refer the matter to arbitration (for the facts see 'ALABAMA,' THE). By the decision of the arbitration board in the *Alabama* case, it was laid down that a neutral gov. is bound to use due diligence to prevent the fitting out in, or departure from, any of its ports of a vessel which it has reasonable ground to believe is intended to carry on war with a power with which it is at peace; and that it is bound to prevent a belligerent making use of its ports as a basis of naval operations, or a source of recruitment of men or military supplies. It is the belligerents' duty to respect neutral ter. and territorial waters, but it is hardly necessary to point out that Germany in 1939 and after respected the rights of no neutral, either in this or in any other respect. Neutral states have the right to repress the intercourse of neutral citizens with citizens of either belligerent, if desired. Belligerents have the right of blockade, of anjary (Lat. *anjuria*, forced service), of visit and search, and of the confiscation of contraband of war. Neutrals must prevent any recruiting, etc., for either belligerent, and must grant impartially any privileges, etc., which are not considered intervention in the struggle.

The right of anjary was considered by the privy council in 1916, when the Crown claimed to requisition neutral property taken in prize. It was decided that the right is to be enforced only by application to the prize court, which must determine whether, under the particular circumstances, it is exercisable. In 1918 Great Britain and the U.S.A. had recourse to the right in the case of property not in the control of the prize court, by requisitioning a number of Dutch vessels that were in Brit. and Amer. ports. A neutral is allowed to give asylum to the troops or vessels of belligerents in circumstances which ensure that the use of its hospitality will be unaggressive. Thus, in 1871, a Fr. army sought asylum in Switzerland, and in the First World War Brit. and Ger. troops both sought refuge in Holland. Such troops must be interned as far as possible at a distance from a theatre of war, but officers may be released on parole. It is agreed that belligerents may not erect on the ter. of a neutral a wireless telegraph station or apparatus intended to serve as a means of communication with belligerent forces, or use any installation of the kind estab. by them before the war on the ter. of a neutral exclusively for a military end and not for the purpose of public correspondence. Thus, in 1914, Great Britain and France successfully protested against the use by Germany of

wireless installations in Ecuador and Colombia.

*American neutrality legislation.* Even the most powerful states are compelled sometimes to make sacrifices of neutral rights in order to keep out of war. This has been the case in Amer. hist., as in 1807 when Jefferson induced Congress to pass the Embargo Act, forbidding foreign commerce altogether by way of retaliation to Britain for her practice of searching Amer. vessels for refugee naval ratings, and to France for the Berlin and Milan decrees; and again in 1935-7, when Congress passed laws giving up certain maritime rights. The freedom of the seas was, therefore, voluntarily sacrificed in the hope of keeping out of war. It was largely in vindication of the freedom of the seas that the U.S.A. fought the war of 1812 and that it entered the First World War in 1917. It would seem that trading with a belligerent is hardly consistent with N. in fact, though it may be allowed by the theory of international law. In the First World War Amer. sentiment was strongly pro-Ally before the abandonment of N. Amer. industry geared itself rapidly to Anglo-Fr. war needs, and Amer. banks acted as purchasing agents for the Allies, floated loans for them, and estab. allied credits, but Amer. trade with the central powers was reduced to negligible proportions. Consistently with its strong element of isolationism or nationalism, coupled with disillusionment with the results of the First World War, Congress strove from 1931 onwards to legislate a cast-iron N. In 1934, when war between Italy and Ethiopia was imminent, Congress wanted to erect insuperable barriers against the export of arms, and laid down rigid rules applicable to all belligerents. Roosevelt, on the other hand, wished to be in a position to carry out a policy of helping in 'collective effort' against the responsible and guilty party, or in other words he wished the N. laws to give him a wide discretion, enabling him to deter or cripple aggressors and to help their victims. No fewer than 15 N. Bills were introduced and the resultant was a measure which prohibited the export of arms or implements of war to any belligerent nation, or to any country which might tranship to a belligerent; made it unlawful for an Amer. vessel to carry arms for or to any belligerent; and authorised the President to warn Amer. citizens that they travelled on the ships of belligerents at their own risk. The President was allowed no power to differentiate between righteous and wicked, aggressor or victim. He was permitted some discretion in defining the terms 'arms, ammunition, and implements of war' and in extending the embargo to states which might become involved in the conflict; but otherwise his hands were tied. There is but little doubt that President Roosevelt ought to have vetoed the measure, for there is evidence that when the Brit. Gov. was weighing the chances of war with Italy its cautious tendency was accentuated by the existence of this Amer. N. law. The Neutrality Act, however, was silent on civil

wars, or on wars partly civil and partly foreign, like the Sp. Civil War, and when Germany, Italy, and Russia all took a free hand in that war, Congress tried to repair the omission by means of a joint resolution forbidding the export of arms to Spain (8 Jan. 1937). This, however, operated unfairly to the Sp. republicans, for the Brit. and Fr. Govs. had failed to get other govts. to observe the 'non-intervention' agreement which they had signed. Germany and Italy broke their neutral or 'non-intervention' pledges and sent not only munitions but men to the insurgents. Thus the embargo did not safeguard Amer. N. because that was never threatened; it merely played into the hands of the aggressor nations. The N. law of 1935 expired on 1 May 1937. America's belief in collective security had gone. Congress was again resolved on a rigid statute, especially one which should include such vital war commodities as scrap metal, copper, and cotton. The N. law of 31 May 1937 retained the embargo on arms, etc., for all belligerents and the provision making it unlawful to deal in belligerents' securities; and it made travel by Americans on belligerent ships unlawful. It allowed the President to extend the embargo to any civil war which threatened the N. of the U.S.A. Its most striking provision, however, was the introduction of the 'cash-and-carry' clause, which in effect meant that after a war had begun those who wanted certain prescribed commodities or goods must come and get them and in effect pay for them. This Act, which was limited to 2 years' duration, marked the zenith of isolationist sentiment and was justifiably condemned by Mr Cordell Hull as substituting 'a wretched little bob-tailed, sawed-off domestic statute for the established rules of international law.' Subsequent events, which need not be detailed here, showed that it utterly failed in its purpose and in any case it was not flawless, for it was not truly neutral. The Act was, in fact, an encouragement to Germany's aggressive policy, as the Nazi gov. naturally hoped that Britain and France would not be able to get war material from America in war-time. Roosevelt urged repeal of the arms embargo early in 1939, and partial repeal was approved by the House of Representatives in July 1939; but the President insisted on full repeal and, eventually, Congress passed the Neutrality Act of 4 Nov. 1939, which provided that Amer. arms, etc., might be sold to belligerent countries only on a cash-and-carry basis. It was forbidden to any person within the U.S.A. to buy bonds or other obligations of a belligerent country gov., issued after the outbreak of war, or to extend credits to such gov. with the exception of certain commercial credits of a character ordinarily used in peace-time. Amer. ships were forbidden to carry supplies to belligerents or to enter combat zones: the coasts of the Brit. Isles, France, Belgium, the Netherlands, Germany, Scandinavia, and the Mediterranean were declared combat zones. Amer. citizens were not to travel on ships of belligerents.

Licences were required for arms exports. The Act did not apply to Amer. reps.

See W. Hall, *International Law*, 1880; L. Jones, *Law and Commerce*, 1907; F. Birkenhead, *International Law*, 1927; L. Oppenheim, *International Law* (vol. II, *Disputes, War, and Neutrality*), 1928; N. G. Politis, *Neutralité et la paix*, 1935; A. Lamont, *Scottish Neutrality*, 1952.

**Neutrality**, in chem., is the state of a substance that has no effect on indicators (q.v.). More strictly, a neutral aqueous solution is one in which the concentration of hydrogen ions (q.v.) is exactly equal to that of the hydroxyl ions. On adding an acid to an alkali, a substance is at length formed that shows no reaction of either an acidic or an alkaline character; the alkali and acid are then said to have neutralised one another.

**Neutrality Zone**, American, zone of 300 m., and in some places up to 600 m., around the whole Amer. continents except Canada, estab. by the 'Declaration of Panama' at a conference of the 21 Amer. reps. at Panama on 3 Oct. 1939. It was suggested at this conference that all warlike acts at sea or in the air should be prohibited in this 'zone of security,' and in case of necessity enforced by joint action. The zone of security, however, was estab. only in theory and provision was made for mutual consultation on practical measures should hostilities occur in it. After the battle off Montevideo (13 Dec. 1939), in which the *Admiral Graf Spee* (q.v.) was sunk, consultation was initiated, and naval experts recommended that the reps. should intern all belligerent warships calling at Amer. ports. The Brit. Gov. protested against the estab. of the N. Z. as incompatible with international law, and as likely to lead to the Germans using the Amer. ports as a sanctuary for their ships. In fact, the zone did not come into practical existence.

**Neutrino**, a particle with no electric charge and of very small rest mass, possibly zero, and certainly less than  $\frac{1}{1836}$  that of the electron. The particle was postulated in 1931 by Pauli to account for the fact that beta particles (q.v.) are emitted from radioactive nuclei with all energies up to a certain maximum value whereas alpha particles (q.v.) have discrete energies. It was shown that the total energy accompanying beta emission corresponded with the maximum beta energy. When slower beta particles are emitted the 'lost' energy is assumed to be taken away by the neutrino, with a velocity equal to that of light. Fermi developed the theory of the N. in 1934 and qualitatively accounted for the number of beta particles with different energies. The N., usually represented by  $\nu$ , is also assumed to be emitted in the decay of certain mesons (q.v.). Because of its negligible mass and zero charge it has an extremely small interaction with matter. However, in 1956 it was detected by its interaction with a proton to produce a neutron and a positron (q.v.). An atomic pile was used for this experiment because it produces an enormous

number of N.s and therefore the probability of observing an interaction is large enough to make the experiment a reasonable proposition. See ATOM BOMB and NUCLEAR POWER.

**Neutron**, one of the elementary constituents of matter, a particle with a mass slightly greater than that of the proton, about 1839 times the mass of the electron, but having no charge. The idea that such a particle existed was suggested by Rutherford about 1920. N.s were first identified by Chadwick in 1932 as the radiation observed by Bothe and Becker in 1930 resulting from the bombardment of beryllium by alpha-particles (q.v.). The investigations of I. Joliot-Curie and F. Joliot in 1932 showed that this radiation ejected protons from hydrogen-containing material (e.g. paraffin) with energies that could not be explained in terms of gamma rays (q.v.), but were able to be accounted for by Chadwick in terms of N.s. Because N.s have no charge they have no electrostatic interaction with charged particles, e.g. protons, but they can collide with protons and suffer an interaction due to *nuclear forces*. N.s can be produced by a variety of nuclear reactions and play an important role in nuclear fission (see ATOMIC BOMB and NUCLEAR POWER). They are considered to be present in the nucleus together with protons. Thus an alpha particle, the nucleus of helium, consists of 2 N.s and 2 protons. The N. is heavier than the proton by about  $2\frac{1}{2}$  electron masses, and can therefore suffer beta decay, i.e. the N. disintegrates into a proton and an electron (see ELEKTRON VOLTR). The half-life (see RADIOACTIVITY) for this process is about 20 min. and has been measured by experiments with an atomic pile, which is a powerful source of N.s.

**Neu-Ulm**, Ger. tn in the *Land of Bavaria* (q.v.), 75 m. W. by N. of Munich (q.v.). It is on the Danube, opposite Ulm (qq.v.). Pop. 14,000.

**Neuve Chapelle**, vil. in the dept of Nord, France, 8 m. SW. of Armentières. There was an important battle around N. C. in 1915, in which the old vil. was almost entirely destroyed. The battle lasted from 10 Mar. to 12 Mar. 1915. Brit. and Indian forces began the attack, in an effort to prevent Ger. reinforcements going to the E. front, and to assist the French. The British won initial success, but by 12 Mar. Ger. reinforcements had been brought up and no further ground was captured. Brit. and Indian casualties totalled over 11,000, and in 1927 a memorial to the Indian dead was unveiled at N. C.

**Neuville, Alphonse Marie de** (1836-85), Fr. painter, pupil of Delacroix and Picot. His large canvases depicting an episode in the siege of Sevastopol made a great sensation in 1859. This was followed by a series of military pictures dealing with the Crimean and Franco-Prussian wars. His most famous picture is 'The Last Cartridges.' He also collaborated with Detaille in the panorama of Rezonville, one of the best works of the kind.

**Neuwied**, Ger. tn in the *Land of Rhineland-Palatinate* (q.v.), on the Rhine, 45 m. NW. of Mainz (q.v.). It was founded in the 17th cent. by refugees of various religious sects. There are metal goods and pumice-stone industries. Pop. 20,000.

**Neuzen**, see TERNEUZEN.

**Neva**, riv. in NW. Russia, flowing out of Lake Ladoga W. into the Gulf of Finland. Although only 46 m. in length it is very full, since it is the only outlet of Lake Ladoga. The whole area of the Neva is dominated by Leningrad, which is situated in and around its delta. It is part of the inner waterways connecting the Baltic Sea with the Volga and the White Sea.

**Nevada**, one of the W. mt group states of the Amer. Union between the Rocky Mts and the Sierra Nevada, bounded on the N. by Oregon and Idaho, on the E. by Utah, on the SE. by Arizona, and on the W. and SW. by California. Practically all of Nevada lies within the Great Basin. Its mt ranges average 50-75 m. in length, 6-15 m. wide, and 7000-10,000 ft. high. In the S. Nevada descends abruptly to the level of the Colorado lt. (470 ft. above sea level). The extreme S. boundary is formed for about 150 m. by the Colorado, and the Humboldt R. flows across over 300 m. of the N. dist., but this and other smaller streams end in salt lakes known as sinks. The climate is very dry and the soil barren except where irrigation has been effected. There maize, wheat, hay, alfalfa, sugar beets, barley, and potatoes are grown, but crops are chiefly subsidiary to the grazing of sheep and cattle. There are some 5,000,000 ac. of forest. The state has about 540,000 head of cattle and 470,000 sheep. Farms comprise over 6,000,000 ac. The leading occupation is mining, especially of silver and gold. Other minerals are copper, lead, zinc, iron, mercury, tungsten, gypsum, graphite, sulphur, vanadium, magnesite, antimony, nickel, cobalt, and borax. In 1950 the value of the mineral output was \$48,499,000. Copper smelting is the chief industry. The mts have yielded over \$1,000,000,000 of mineral wealth, of which the former Comstock lode has produced 60 per cent. The chief tns are Reno (32,497), which has a state univ. and an aerodrome, Las Vegas (24,624), Sparks (8203), and Carson City, the cap. (3082). Nevada was admitted to the union in 1864, and is represented in Congress by 2 senators and 1 representative. Its legislature consists of a senate of 17 members and an assembly of 47 members. It has a land area of 110,540 sq. m. In this state the death penalty is inflicted by means of lethal gas. The short period of residence for divorce, 6 weeks, makes Reno and Las Vegas favourite resorts for this purpose. Nevada is popularly called the 'Sagebrush state.' An atomic testing ground has been estab. in the Nevada desert with H.Q. at Indian Springs. Pop. 160,083. See J. G. Scruggs, *A History of Nevada*, 1935, and D. L. Morgan, *The Humboldt: Highroad of the West*, 1943.

**Névé**, or **Firn**, closely packed snow

formed in permanent snowfields by consolidation of the loose flakes under the weight of subsequent falls of snow.

**Nevers** (ancient *Noviodunum*), Fr. tn, cap. of the dept of Nièvre, on the Loire. It was sacked by the Aedui in 52 BC while a depot for Caesar. The bishopric dates from the 6th cent. It has many fine buildings, including an 11th-cent. church, the cathedral, partly 13th cent., and a 15th-16th-cent. ducal palace. Chaumette (q.v.) was b. here. It has foundries, railway workshops, and printing works, and manufs. pottery and wines. Pop. 34,000.

Parliament on Cromwell's death and sat in the Commons for some years. In 1663 he was arrested on the suspicion of being concerned in the Yorks rising, but was acquitted. He was well known for his trans. of Machiavelli's works, 1675, and he wrote many offensive lampoons, including *Shuffling, Cutting, and Dealing in a Game of Picquet*, 1659, directed against Oliver Cromwell and others. He also pub. a short novel, *The Isle of Pines*, 1668.

**Neville, Richard**, see **WARWICK**, **EARL OF**.

**Neville, Richard**, 1st Earl of Salisbury



E.N.A.

NEVADA: THE STATE HIGHWAY BETWEEN VICTORY AND LINCOLN

**Neveu, Ginette** (1919-49), Fr. violinist, b. Paris. She studied at the Paris Conservatoire and with Karl Flesch, first appearing in public with the Colonne orchestra, when she was 7 years old. She appeared with leading Brit. orchestras many times between 1945 and 1949. Her interpretation of Beethoven was particularly outstanding: at her death she had estab. a reputation as the leading woman violinist of the cent. She was killed in an aeroplane accident while travelling to the U.S.A.

**Neviges**, Ger. tn in the Land of N. Rhine-Westphalia (q.v.), 8 m. ENE. of Düsseldorf (q.v.). Until 1935 it was called Hardenberg. There are textile and engineering manufs. Pop. 15,000.

**Neville, Henry** (1620-94), author, b. Billingbear, Berks. His political activities displeased Cromwell, who banished him from London in 1654. He entered

(1400-60), son of Ralph N., 1st Earl of Westmorland. He acquired his title through his wife in 1429, laying claim to it on the death of his father-in-law. He was warden of the W. Marches, and as such persuaded York to lay down his arms in 1452, and when the latter gained control of the gov., when Henry VI was temporarily insane, gave him his support and was made chancellor. He was defeated by the Lancastrian forces at Ludford (1459) and fled to France, but returned in 1460 and remained in charge of London while Warwick went to meet the Lancastrians at Northampton. He was captured after the battle of Wakefield and murdered in Pontefract Castle.

**Neville's Cross** (Durham), see **DAVID II**.

**Nevin, Ethelbert** (1862-1901), Amer. composer, b. Edgeworth, Pennsylvania. He studied at Berlin, Boston, and Paris. He wrote light piano pieces and songs,

among the latter of which *The Rosary* (1898) had a tremendous vogue.

**Nevins, Allan** (1890- ), Amer. historian and journalist, educ. at Illinois and Columbia Univs. After working on various newspapers he became prof. of Amer. hist. at Columbia Univ., 1931. He was Harnsworth prof. at Oxford, 1940-1, and Director of the U.S. Information Service in Britain, 1946-7. N. has contributed much to the study of 19th-cent. Amer. hist. and his pubs. include a life of *Grover Cleveland*, 1932 (Pulitzer prize); *John D. Rockefeller*, 1940; *America, The Story of a Free People*, 1942; *The Ordeal of the Union* (Scribner Centenary and Bancroft prizes), 1946; a life of *Henry Ford*, 1953.

**Nevinson, Christopher Richard Wynne** (1889-1946), painter, etcher, and lithographer, b. London, son of Henry Woodd N. (q.v.). He studied art at St John's School of Art, the Slade School, and in Paris. Becoming known for war paintings, his first exhibition of these being in 1916, in 1917 he was appointed an official war artist. Some of his war pictures were bought by the Imperial War Museum and the Canadian War Memorials Fund. His subjects cover a wide range, but he is concerned less with artistic effects than with emphasising his comments on life. He made use of cubist, futurist, and similar expedients in design, though less from intellectual conviction than as an experiment. Among his best works are 'The New Forest' and 'Autumn Sunshine,' both of which give the effect of depth. His etchings include 'Manor Gates,' 'Looking through Brooklyn Bridge,' 'Cornish Landscape,' 'Ebb Tide, Rye,' 'Barmouth Estuary,' 'Steam and Steel,' and 'The King is Dead' (a pastel head). Some have been bought by the Brit. Museum, Tate Gallery, Birmingham and other city art galleries, Harvard Univ., etc. He pub. an autobiographical vol., *Paint and Prejudice*, 1937.

**Nevinson, Henry Woodd** (1856-1941), journalist, b. Leicester. He was educ. at Shrewsbury, Christ Church, Oxford, and Jena. He wrote 2 vols. of sketches and a *Life of Schiller*, 1889, which distinguished him as a writer of rare quality. As a war correspondent for the *Daily Chronicle* in the S. African war, he shared all the horrors of the siege of Ladysmith. Meantime his *Plea of Pan*, 1901, and *Between the Acts*, 1903, had won him fame. A journey to Angola resulted in the revelations of *A Modern Slavery*, 1906. He investigated the revolution in Russia, which he described in *The Dawn in Russia*, 1906. He was correspondent for the *Manchester Guardian* in the First World War on the W. front, and later at the Dardanelles, Salonika, and Versailles. His *Dardanelles Campaign*, 1918, together with *Essays in Freedom*, 1909, and *Essays in Rebellion*, 1913, are among his finest work. He also wrote *Lines of Life* (a book of verse), 1920, *Original Sinners* (a gallery of portraits), 1920, a critical study of Goethe, 1931, *Running Accompaniments* (essays), 1936, and, in 1939, *Films of Time* (fantasy). His last work was a

book of criticism and recollection with Thomas Hardy as the subject, pub. posthumously. His best-known books are the autobiographical series *Changes and Chances*, 1923, *More Changes, More Chances*, 1925, and *Last Changes, Last Chances*, 1928.

**Nevis** (formerly *Nievis* or *Mevis*), one of the Leeward Is., Brit. W. Indies, in the presidency (formed in 1882) of St Kitts, Nevis, and Anguilla. It lies in 17° 14' N. and 62° 33' W., and is separated from St Kitts by the 2-m. 'Narrows.' It has an area of 50 sq. m. and a pop. of 15,000. Like St Kitts the is. is volcanic but, unlike St Kitts, it is to a great extent covered with volcanic ashes from former eruptions; it is in fact one large mt. cone, the Peak, 3600 ft. Sugar-growing was formerly the prin. industry, but the cultivation of Sea Is. cotton has taken its place. Coco-nuts, yams, sweet potatoes, etc., are also cultivated. The climate, for a tropical is., is bracing and healthy; average ann. rainfall is 53 in., and the mean temp. ranges between 70° and 85° F. There are very few streams, and the water supply is derived from a catchment area high up on the mt and stored in public reservoirs, which furnish Charlestown, the cap. (pop. 1900), and some country dists. There are 11 elementary schools and 1 secondary. In Charlestown, which lies on the shore of a wide-curving bay in the SW., are the remains of the house in which Alexander Hamilton, who drafted the constitution of the U.S.A., was b. (11 Jan. 1757). The ancestral estate to the SE. of the tn is still known as 'Hamilton's.' The old Bath House Hotel is a conspicuous building near by and serves as a link with the past when Nevis was a fashionable health resort noted for its hot springs. The house is so solidly built that it has resisted the hurricanes of over a cent. Many old writers testify to the merits of the waters from the thermal springs, including Richard Blome and the Rev. Mr Smith, author of the *Natural History of Nevis*, 1745. It was in Nevis that Nelson met and married his bride, the widow Frances Nisbet, who was the niece of Herbert, president of Nevis. Nelson and Mrs Nisbet were married at Montpelier, 11 Mar. 1787, and the record of the marriage is still to be seen in the register at Fig Tree Church. Nelson's memory is also perpetuated by Nelson's Watering-place, a creek 3 m. N. of the cap. Nevis was discovered by Columbus in 1493 and was so named by him because its cloud-capped summit resembled *nieve* or snow. The is. was included in the grant to the Earl of Carlisle in 1627 and colonised by Eng. settlers from St Kitts in 1628. The settlement was nearly destroyed by the Spaniards the following year, and in 1706 it was laid waste by the French, who took away some 3000 slaves. The is. was captured by the French under the Marquis Bouillé in 1782, but was restored to England by the treaty of Versailles in 1783.

**Nevis, Ben**, see BEN NEVIS.

**New Albany**, city, cap. of Floyd co., Indiana, U.S.A., on Ohio R. (bridged) opposite Louisville, Kentucky. It



manufs. automobile parts, veneers and plywood, furniture, and prefabricated houses. Pop. 29,350.

**New Amsterdam:** 1. Tn of Brit. Guiana, on the Berbice, 63 m. SE. of Georgetown. The tn is traversed by canals. Pop. 10,000.

2. The old Dutch name for what is now New York city.

**New Bedford,** seaport city of Bristol co., Massachusetts, U.S.A., on Buzzards Bay, 55 m. S. of Boston. It was once the centre of the Amer. whale fisheries. Oil refining, tanning, and boot and shoe

breadth of 50 m. and is 300 m. long. It is very undeveloped except on the Gazelle Peninsula in the N. and in the S., where there are some plantations. The interior is but little known. A mt chain traverses the entire length of the is. and there are active volcanoes. There are some good harbours, but Simpson Harbour, in Blanche Bay, is the only one visited regularly by oversea shipping. Copra is the chief product, and coffee and cocoa are also cultivated. Gold, copper, and coal are mined. Rabaul (q.v.) is the chief port. N. B. was discovered by Dampier



*Canadian National Railways*

SOUTHERN CROSS CAPE, GRAND MANAN ISLAND, NEW BRUNSWICK

making are carried on, besides the manuf. of silk and woollen goods. It has oil and candle factories, soap factories, sev. large cotton-mills, hoop-iron manufactories, and barrel factories. Of late years the oil business has declined, but N. B. has become one of the chief raw cotton concentration points in the E. It manufs. also cotton-spinning machinery, cotton goods, and cut glass. It is a summer resort and has a textile school. Pop. 109,189.

**New Bern,** city and co. seat of Craven co., N. Carolina, U.S.A., 85 m. NE. of Wilmington. It is a fishing, shipping, and boat-building centre; its chief manufs. include lumber, veneer, fertiliser, and clothing. Pop. 15,812.

**New Brighton,** see WALLASEY.

**New Britain:** 1. Largest is. of the Bismarck Archipelago (q.v.) in the Pacific Ocean, off the coast of Papua; has a mean

breadth of 50 m. and is 300 m. long. It is very undeveloped except on the Gazelle Peninsula in the N. and in the S., where there are some plantations. The interior is but little known. A mt chain traverses the entire length of the is. and there are active volcanoes. There are some good harbours, but Simpson Harbour, in Blanche Bay, is the only one visited regularly by oversea shipping. Copra is the chief product, and coffee and cocoa are also cultivated. Gold, copper, and coal are mined. Rabaul (q.v.) is the chief port. N. B. was discovered by Dampier

in 1699. The natives are Melanesians. Area of N. B. and adjacent is. is about 14,600 sq. m. Pop. (indigenous) 90,000.

2. City of Hartford co., Connecticut, U.S.A., 8 m. SW. of Hartford. Its chief manufs. are hardware, household electrical appliances, bearings, tobacco, foundry and machine-shop goods, clothing, wood and paper products. It has a state teachers' college. Pop. 73,726.

**New Brunswick:** 1. E. prov. of the dominion of Canada, is bounded on the NW. by the Bay of Chaleur, on the NE. by the Gulf of St Lawrence and the Strait of Northumberland, on the S. by Nova Scotia and the Bay of Fundy, and on the SW. by the state of Maine. These waters provide the prov. with a very extensive sea coast, 500 m. in extent, and indented by spacious bays, inlets, and harbours, which afford safe and commodious anchorage for shipping. The chief are the

Bay of Fundy, Chignecto Bay, and Cumberland Basin, the last 2 being merely extensions of the first; Passamaquoddy Bay in the S.; Verte, Shediac, Cocagne, Richibucto, and Miramichi Bays on the N.E.; and the Bay of Chaleur, 80 m. long by 27 m. broad, in the N.W. The surface is for the most part flat or undulating. With the exception of the dist. in the N. and W. bordering on the R. Restigouche and the state of Maine, no portion of N. B. is very high. The shores on the E. coast, and for 20 m. inland, are flat. The most S. point is a little S. of  $45^{\circ}$  N. lat., and its most N. a little N. of  $48^{\circ}$ . To the SW. is

and radioactive minerals, added to already known quantities of bituminous coal, gypsum, and limestone, makes possible the development of the mining industry into one of the leading industries of N. B. The greatest concentrations of valuable ores have been discovered in the Bathurst and Newcastle areas, but almost all parts of the prov. have recorded finds of considerable value. The value of mineral production in 1954 was \$12,168,322 with a prospect of at least a \$3,000,000 increase for 1955. Lumbering and the manuf. of wood-pulp are the leading industries, but woollen goods,



*New Brunswick Government Information Bureau*  
A RANCH IN ALBERT COUNTY, NEW BRUNSWICK

a group of is. belonging to the prov., the most important of which are Grand Manan, Campobello, Deer, and the W. Isles. The prov. of N. B. abounds in rvs. The prin. of those falling into the Bay of Fundy are the St John and the St Croix, the former 450 m. and the latter 100 m. in length; and of the rvs. that flow eastward into the Gulf of St Lawrence are the Richibucto, the Miramichi, and the Restigouche. The prov. contains numerous lakes, one of which, Grand Lake, is 100 sq. m. in area. The soil is deep and fertile, over 950,000 ac. being agric. land, producing a variety of crops amongst which potatoes, oats, and barley are prominent. The fisheries are valued at about \$22,000,000 annually. The climate is remarkably healthy, the autumn, especially the season called the Indian summer, being particularly agreeable.

The discovery, in 1951 and succeeding years, of some of the world's greatest proven concentrations of ore bodies, containing lead, zinc, silver, pyrites, copper, nickel, antimony, manganese, tungsten,

machinery, sugar, and paper are also manuf. Oil and natural gas are produced. The water-power resources of N. B. are great and it is estimated that the available and developed power is as much as 600,000 h.p. The Beechwood development (137,000 h.p.) was under construction in 1956. The prov. is represented in the Dominion Senate by 10 members and in the Commons also by 10. N. B., together with Nova Scotia, originally formed one Fr. colony, called Acadia. It was ceded to the British in 1713 and was first settled by Brit. colonists in 1764. Twenty years subsequently, in 1784, it was separated from Nova Scotia, and made an independent colony. The cap. is Fredericton (q.v.); the largest city is Saint John (q.v.). Area 27,985 sq. m. (crown lands 7,500,000 ac.); pop. 457,400.

2. City of New Jersey, U.S.A., on the S. bank of the Raritan R., 22 m. SE. of Newark. It manufs. machinery, motor vehicles and parts, hospital supplies, chemicals, and pharmaceuticals; it also produces metal, wood, concrete, cork, and

felt products, clothing, leather goods, and dairy products. It is the seat of Rutgers Univ. and has a theological seminary, a state agric. college, and U.S. atomic laboratory. Near by is Camp Kilmer, troop centre; Joyce Kilmer's hp. and revolutionary houses are preserved. Pop. 38,800.

**New Caledonia**, is. of the S. Pacific Ocean, belonging to France, and lying about 720 m. ENE. of the coast of Queensland in Australia, in lat. 20°-22° 30' S., long. 164°-167° E. It is about 250 m. in length, 30 m. in breadth. It is of volcanic origin, is traversed in the direction of its length, from NW. to SE., by a range of mts, which in some cases reach the height of about 8000 ft., and is surrounded by sand-banks and coral reefs. There are secure harbours at Port Balade and Port St Vincent, the former on the NE., the latter on the SW., part of the is. In the valleys the soil is fruitful, producing coffee, coco-nut, banana, mango, breadfruit, etc. The coasts support considerable tracts of forest, but the mts are barren. N. C. is rich in minerals: nickel, chrome, cobalt, silver, gold, lead, copper, manganese, antimony, platinum, and zinc. There are nickel smelters at Yate and Doniambo. N. C. also has a large livestock industry. The cap. is Noumea (10,400). N. C. is administered by a governor and privy council. There is also an elective council-general of 15 members. There is a narrow-gauge railway from Noumea to Paita (20 m.).

N. C. was discovered by Capt. Cook in 1774. It was claimed by the French in 1854 and used as a penal colony until 1894. N. C. became a Fr. Overseas Ter. in 1954. Its area is 8548 sq. m., and it has a pop. of 48,000. Dependencies of N. C. are the is. of Pines, Wallis and Futuna Is., Loyalty Is., Huon Is., Bélep Archipelago, and Chesterfield Is. See J. Macmillan Brown, *Peoples and Problems of the Pacific*, 1927; W. G. Burchett, *Pacific Treasure Island*, 1941.

**New Castle**, see CASTILLA LA NUEVA.

**New Castle**: 1. Co. seat of Lawrence co., Pennsylvania, U.S.A., on the Shenango R., 43 m. NW. of Pittsburgh. The region is rich in coal, iron, and other minerals, and the chief manufs. are tinplate, fire-brick, flour, steel wire, glass, chemicals, heating equipment, auto parts, clothing, and beer. Its shipping trade is extensive. Pop. 48,830.

2. City, co. seat of Henry co., Indiana, U.S.A., in agric. area 41 m. NE. by E. of Indianapolis. It has greenhouses and manufs. machinery, automobile parts, furniture, etc. Pop. 18,300.

**New College**, Oxford, founded by Wm of Wykeham in 1379 as the college of St Mary of Winchester, the long title arising from the existence of another St Mary's College. The fine buildings retain much of the founder's design, and are notable for the chapel containing his pastoral staff, also for the cloisters (consecrated in 1400), and the massive detached tower. New buildings have been added. The lovely grounds contain portions of the old city wall. The original link with Winchester is

maintained by the reservation of 6 scholarships to boys from Winchester College.

**New Deal**, policy adopted by President Franklin Roosevelt in 1933 to overcome the crisis which threatened the collapse of the economic system of the U.S.A. Up to the time of the N. D. the states were presumed to have jurisdiction over almost all matters of a social character; thus the hours and wages of labour, the conditions of factory work, the welfare of women and children, education, etc., were all matters of state, not federal, concern. The N. D. changed this, but it required a national catastrophe to justify, and a bold administration to attempt, the change; and it was carried out only over the determined opposition of the supreme court. The N. D. legislation, which President Roosevelt's administration introduced, consisted partly of measures for recovery and relief, partly of measures for reform. It comprised a series of far-reaching economic and social measures, which reversed previous attempts to end the depression by ordinary deflationary means, and it was largely designed by a body of profs. and other expert advisers (nicknamed the 'Brain Trust') in 1932. The starting-point was the National Industrial Recovery Act of 1933, which, together with its agric. corollary, the Agricultural Adjustment Act (providing for large-scale assistance to farmers), placed control of industry and agriculture in the hands of the president. It set on foot a generous programme of expenditure on public works, so as to stimulate business and provide employment, aims which were helped by devaluation of the dollar by 40 per cent., and by the formation of the Reconstruction Finance Corporation, which granted the necessary loans, and the abandonment of the gold standard. It inaugurated a comprehensive programme for the conservation of natural resources, one of the chief instruments of which was the Civilian Construction Corps, which gave work to some 3,000,000 young men. It set up elaborate systems of unemployment relief, and, by 1940, some 16 billion dollars had been spent on direct relief and 7 billion on public works. Workers were encouraged to form trade unions by the Wagner Labor Relations Act, 1935, which Act, with the Fair Labor Standards Act, 1938 (designed to provide reasonable hours and wages), was an improvement on the labour provisions of the National Industrial Recovery Act of 1933, which latter Act had been voided by the court in 1935. A scheme of social insurance was introduced by the Social Security Act. The Banking Act and the Securities Exchange Commission placed financial control in the hands of the administration, thereby breaking the power of Wall Street. The N. D. raised taxes on the incomes of the rich and of corporations. It set up the highly successful Tennessee Valley Authority to develop the resources of one of the great interior basins of the country through the use of state-owned hydro-electric dams. In the field of labour, the N. D. enacted a series of epoch-making laws; while among

reforms in administration was the Hatch Act, which was directed against 'pernicious political activities' on the part of gov. employees and the corruption and extravagance of political parties. Essential parts of the National Industrial Recovery Act were declared invalid by the supreme court on 27 May 1935, and part of the Agricultural Adjustment Act on 6 Jan. 1936, but the chief economic institutions inaugurated on the basis of those Acts remained in existence and exerted a considerable influence on Amer. developments. The N. D. policies did not end unemployment, but certainly reduced the numbers (17,000,000) by anything up to 10,000,000.

To many contemporaries the N. D. seemed like a revolution, but in reality it was conservative in the same sense that the democratic policy of Jefferson and Wilson had been conservative. Its aim was to protect, against violation from the left or the right, the essentials of Amer. democracy, namely, the balance of interests under the constitution and security for property and for men. If in its philosophy the N. D. was democratic, in method it was evolutionary. 'Because for fifteen years legislative reforms had been damned up, they now burst upon the country with what seemed like violence, but when the waters subsided it was clear that they ran in familiar channels' (Nevins and Commager). The conservation policy of the N. D. had been begun by Theodore Roosevelt; railroad and trust regulation was initiated some 50 years earlier; banking and currency reforms had been advocated by Bryan and, to some extent, achieved by Wilson; the farm relief programme owed much to the Populist party of the nineties; while in the sphere of international relations its policies were really continuations of the traditional policies of strengthening national security, maintaining the freedom of the seas, supporting law and peace, and championing democracy in the W. world. See A. M. Bingham, *Challenge to the New Deal*, 1934; T. E. Dewey, *The Case Against the New Deal*, 1940; J. T. Adams, *The Epic of America*, 1940 ed.; A. Nevins and H. S. Commager, *America: the Story of a Free People*, 1942; Frances Perkins, *The Roosevelt I Knew*, 1947; D. R. Fusfeld, *Economic Thought of Franklin D. Roosevelt and Origins of the New Deal*, 1956.

**New Dongola**, tn in Dongola, Sudan, on the l. b. of the Nile, 105 m. NW. of Merowé. It is the chief centre of trade and has an airfield. Pop. 16,900.

**New Economic Policy** (abbr. N.E.P.), economic policy of the Bolshevik Gov. in Russia, 1921-8, aimed at restoring the economy through concessions to private enterprise in agriculture, trade, and industry, and at neutralising the peasants politically. The policy was very successful, and the 1913 production level was achieved by 1927. See also **WAR COMMUNISM** and **FIVE YEAR PLANS**. See M. Dobb, *Soviet Economic Development since 1917*, 1948, and E. Schwartz, *Russia's Soviet Economy*, 1951.

**New England**, collective name applied to the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Is., and Connecticut, in the NE. of the U.S.A. The coasts were explored by Sir Humphrey Gilbert in 1583, and the dist. in 1614 by Capt. John Smith, who suggested the name. N. E. was the scene of the second area of permanent Eng. settlement in America (began 1620 at Plymouth Rock). Area 63,206 sq. m.; pop. 9,314,453.

**New English**, see **ENGLISH LANGUAGE**.

**New European Order**, see **NEW ORDER**.

**New Forest**, district in Hampshire (q.v.), England, triangular in shape, and bounded on the W. by the R. Avon, on the S. by the coast, and on the NE. by a line running from the borders of Wilts along Southampton Water. Area about 145 sq. m. It was already a forest when Canute issued his Laws at Winchester in 1016; in Domesday Book much of the area was crown land; William the Conqueror extended its area and enforced the Forest Laws more harshly. His sons Wm Rufus and Richard both met their deaths there while hunting. The main commercial importance of the forest was in the timber which was used extensively by the naval shipwrights from the 17th to the 19th cents. The prin. trees in the forest are oak and beech, with large patches of holly as undergrowth. Deer were removed officially in 1851, though they still exist in the N. F. A small breed of pony lives in the forest. Nutley and Denny is a nature reserve. Among the places of interest in the forest are the vil. of Minstead, and its church with a 3-tiered pulpit and 2 galleries; Lyndhurst (q.v.) and its Verderers Hall; Wilverley Post, with fire watch-tower; Winchelsea Moor; Brookenhurst; and Beaulieu, with its ruined abbey of King John's time. Under a Bill introduced in the House of Lords at the end of 1948 the verderers may authorise, on terms, the enclosure by the Forestry Commissioners of up to 5000 ac. of forest land for the growth of timber; and also the enclosure, temporarily, of the ancient and ornamental woods so as to secure their preservation for regeneration. The verderers may also agree with the Ministry of Agriculture for the enclosure of up to 3000 ac. for cultivation and the improvement of grazing. Finally, the Bill provides for the reconstitution of the Court of Verderers. Of the 10 verderers 1 will be the official verderer, 5 will be elective, and 4 will be appointed by the Ministry of Agriculture, the Forestry commissioners, the local planning authority, and an amenity preservation society to be designated. The Bill extends the purposes for which the verderers may make or alter by-laws. See J. R. Wise, *The New Forest, its History and Scenery*, 1883; R. L. P. Jowitt, *Hampshire*, 1949; B. Vessey-Fitzgerald, *Hampshire and the Isle of Wight*, 1949; R. Wightman, *Wessex Heathland*, 1953.

**New Forest Pony**, see **HORSE**.

**New Forest Ware**, local fashion of Rom. pottery made chiefly in that area, where the kilns have been investigated, in the

latter part of the 3rd and the 4th cents. One variety has a dark metallic glaze while another shows a red slip on a cream or white fabric. White paint and rosette stamps are used as decoration.

**New Georgia Island** (Pacific Ocean), *see* SOLOMON ISLANDS.

**New Glasgow**, tn of Pictou co., Nova Scotia, Canada, on East R., 10 m. SE. of the seaport of Pictou. There are rolling and steel plate works, car works, foundries, woodworking and brick plants. Coal-mines are worked in the neighbourhood and agriculture is carried on. Pop. 9933.

**New Granada**, *see* COLOMBIA.

**New Guinea**, second largest is. in the world, N. of Australia, from which it is separated by the Torres Strait. Area about 304,200 sq. m., comprising a broad central mass from which protrude peninsulas to the W. (Vogelkop) and SE. Prominent features are the Gulf of Papua (SE.) and Geelvink Bay (NW.). Series of mt ranges run the length of the is. (1500 m.): Nassau (Mt Carstensz, 16,400 ft) and Orange Ranges in the W., Bismarck Mts and Owen Stanley Range in the E. There are many large navigable rivers. The climate is humid in coastal areas, but healthy in the highlands, with heavy rainfall except in the Port Moresby area. Dense jungle produces sago, coco-nut, and nipa palms, ebony, sandalwood, rubber, casuarina, cedar, etc. The fauna is similar to that of Australia. Agric. products include copra, rubber, coffee, sisal, and kapok. Mineral resources are gold and oil. Pop. about 1,750,000, comprising Melanesians, Negritos, and Papuans. N. G. was named by the Portuguese in 1546. The Dutch occupied parts of the W. in the 18th cent. and annexed them in 1848. In 1884 the NE. was annexed by Germany, and the SE. by Britain. Since the First World War all the E. has been administered by Australia, but the is. was occupied by the Japanese in the Second World War. There are 3 political divs.:

- (1) Netherlands N. G., W. of 141 meridian; area 159,375 sq. m.; pop. about 346,000.
- (2) Ter. of N. G., NE., and including the Bismarck Archipelago, Admiralty Is., and Solomon Is.; area 93,000 sq. m.; pop. about 1,000,000.
- (3) Papua, in SE., and including Trobriand, D'Entrecasteaux, and Louisiade Is. *See* H. Cayley-Webster, *Through New Guinea and other Cannibal Countries*, 1898; C. G. Seligman, *The Melanesians of New Guinea* (anthropological), 1910; C. G. Rawlings, *The Land of the New Guinea Pygmies*, 1913; F. W. Eggleston (ed.), *The Australian Mandate for New Guinea*, 1928; J. F. Champion, *Across New Guinea*, 1934; C. A. W. Monckton, *New Guinea Recollections*, 1934; J. G. Hides, *Through Wildest Papua*, 1935, and *Papuan Wonderland*, 1936; W. C. Groves, *Native Education and Culture Contact in New Guinea*, 1936; N. Goodall (ed.), *The New Guinea News*, 1942; A. Hyma, *The Dutch in the Far East*, 1942; L. P. Mair, *Australia in New Guinea*, 1948; E. Cheesman, *Six-legged Snakes in New Guinea*, 1949; E. M. O. Laurie and J. E. Hill, *List of Land Mammals of New Guinea*, 1954.

**New Guinea, British**, *see* PAPUA.

**New Hall**, Cambridge, third college for women in the univ., opened in Oct. 1954. Plans are projected for development along lines similar to those followed by the existing colleges.

**New Hamburg**, vil. of Waterloo co., Ontario, Canada, on R. Nith, 75 m. WSW. of Toronto. Pop. 1897.

**New Hampshire**, one of the New England states (known as the 'Granite State'), and one of the original 13 states of the U.S.A., between Vermont and Maine and N. of Massachusetts, with 18 m. of coast on the Atlantic. Land area is 9024 sq. m. The surface is largely mountainous, the chief range being the White Mts in the N. (Mt Washington, 6288 ft, is the highest in the New England states and in NE. U.S.A.) The range is cut by valleys and 'notches' (notably Franconia notch and Crawford notch). There are many rivers, the chief being the Androscoggin, Merrimack, Saco, Salmon Falls, and Connecticut, which afford plentiful water power. There are also about 600 small lakes, of which Winnepesaukee is the largest (25 m. long, 12 m. wide). Hay, potatoes, corn, vegetables, and fruit are grown. Fish resources include lobster, herring, and mackerel. Commercial forest resources comprise about 4,700,000 ac., and national forests about 806,000 ac. Manufs. are numerous and important, and include boots and shoes, gloves, cotton goods, woollens, hosiery, tools, machinery, and lumber and paper products. There are good granite quarries. Feldspar, mica, beryl, sand, gravel, and garnet resources are also worked. The univ. of N. H. at Durham was founded in 1866, and Dartmouth College at Hanover in 1769. The cap. is Concord (pop. 28,000). The prin. tas are Manchester (82,730), Nashua (34,660), Portsmouth (18,830), Berlin (16,615), Keene (16,530), Dover (15,870), and Laconia (14,575). N. H. was settled by Englishmen in 1623, and came under jurisdiction of Massachusetts in 1641. It became a separate royal prov. in 1679. Franklin Pierce, a native of N. H., was elected fourteenth president of the U.S.A., 1852. Pop. 533,242. *See* H. H. Metcalf, *History of New Hampshire*, 1926; Federal Writers' Project, *New Hampshire: a Guide to the Granite State*, 1938; T. Kalijarvi and W. C. Chamberlin, *The Government of New Hampshire*, 1939.

**New Harmony**, tn in Indiana, U.S.A., on Wabash R., 22 m. NW. of Evansville, with oil wells and gravel pits. It was settled in 1815 by Ger. Harmonists, who sold out in 1824 to Robert Owen. The Workingmen's Institute Library is here. Pop. 1400. *See* G. B. Lockwood, *The New Harmony Communities*, 1902.

**New Haven**, co. seat of N. H. co., Connecticut, U.S.A., on Long Is. Sound, with an important foreign and coastwise commerce. It has many handsome buildings, public squares, parks, and gardens. It is the seat of Yale Univ., the Connecticut Univ. College of Pharmacy, Berkeley Divinity School, Albert Magnus College, Arnold College, and Larson College. It

is a commercial distributing centre, and has manufs. of electrical equipment, cutlery, wire and metal goods, paper boxes, clothing, lamps, rifles, clocks, hardware, and corsets. In addition there are meat-packing concerns, railroad shops, and trap-rock quarries. Fishing and dairy farming are carried on in the dist. Pop. 164,443.

**New Hebrides**, archipelago of Polynesia in the SW. Pacific Ocean, 1100 m. E. of Australia, lying between 13° and 20° S., and 166° and 170° E., and extending over 500 m. The N. II. (the total area of which is about 5700 sq. m.) include the Banks and Torres groups. The largest is. of the group are Santo (75 m. by 40 m.) and Malekula (nearly as large). Other is. are Efate, Ambrym, Erromanga, Epi, Aoba, Pentecost, and Macovo. In addition there are at least 60 small is. and islets. There are 4 good harbours: Vila and Havannah on Efate, and Ports Sandwich and Stanley on Malekula. The H.Q. of the administration are at Vila, which is the chief trade centre. The is. are volcanic and free from coral reefs. The soil is rich and deep, densely wooded, and produces breadfruit, sago-palm, bananas, sugar-cane, yam, taro, arrowroot, oranges, pineapples, and coffee, and particularly sandalwood. The chief exports are copra, coffee, cocoa, shell, and sandalwood. The natives are Melanesians and Polynesians. By a convention of 16 Nov. 1887 Britain and France set up a joint naval commission to protect the lives and property of the Brit. and Fr. subjects of the group, and in 1906 a Brit.-Fr. condominium gov. was estab. There is steamboat communication with Australia. The N. II. group was discovered by the Sp. explorer de Quiros (1606), who imagined he had at last found the long-sought S. continent and therefore named it Tierra Australia del Espíritu Santo. Bougainville visited the is. in 1768. It remained, however, for Cook to discover and chart the greater part of the group in 1774. Pop. 45,000. See also *ESPIRITU SANTO* and *MALEKULA*. See H. Le Chartier, *La Nouvelle Calédonie et les Nouvelles-Hébrides*, 1885; E. H. Imhaus, *Les Nouvelles-Hébrides*, 1890; Dr Robert Lamb, *Saints and Savages*, 1908; E. Jacob, *France and England in the New Hebrides*, 1914; W. H. R. Rivers, *History of Melanesian Society*, 1914; C. B. Humphreys, *The Southern New Hebrides: an Ethnological Record*, 1926; J. R. Baker, *Man and Animals in the New Hebrides*, 1929; T. H. Harrison, *Savage Civilisation*, 1936; *Captain Cook's Voyages* (Everyman's Library); Oxford Univ. Exploration Club, *New Hebrides Papers*, 1951.

**New Holland**, former name for Australia (q.v.).

**New Iberia**, cap. of Iberia par., Louisiana, U.S.A., 125 m. N. of New Orleans. It has manufs. of jewellery, paper, lumber, and foundry and machine-shop products. Salt is mined in the dist., and fruits, cereals, and sugar produced. Pop. 16,500.

**New Ireland**, is. of the Bismarck Archipelago (q.v.), area 3340 sq. m., length 230 m.; pop. about 20,000. Kavieng is the chief tn. and port. It exports copra.

**New Jersey**, middle Atlantic state of the U.S.A., in the N. Atlantic group, bounded on the N. and NE. by New York, on the W. by Pennsylvania and Delaware, and on the S. by the Atlantic and Delaware Bay. It was the third of the original 13 states which ratified the Federal Constitution. Area 7836 sq. m. (314 sq. m. being inland water). The N. of the state is hilly, being intersected by the N. J. Highlands, including the Ramapo Mts, Schooley Mt, and Musconetcong Mt. Kittatinny Mt (1801 ft) is the state's highest point. These belong to the Appalachian system. To the S. the state becomes a gently undulating plain, sloping E. and W. It is drained by its chief rvs., the Passaic, Hackensack, and Raritan. The Hudson borders N. J. on the E. and the Delaware on the W. N. J. has numerous small lakes. The coastline is marked by barrier beaches, sand spits, and dunes backed by lagoons and marshes, and is studded with well-known resorts, including Atlantic City, Asbury Park, and Cape May. The land is well wooded and fertile. Some 2,300,000 ac. of hardwood forest remain, including oak, pine, maple, cedar, beech, birch, hemlock, and yellow poplar. Broad acres of scrub oak and stunted pine in the S. half of the state comprise the 'pine barrens.' N. J. is noted for its truck gardening and is fittingly called the 'Garden State.' Produce includes white and sweet potatoes, tomatoes, asparagus, peppers, sweet corn, lettuce, spinach, chard, and other market crops. Food processing is a major industry; and many fruits are raised, including apples, peaches, grapes, strawberries, and blackberries; marshland is utilised for cranberry bogs. In the N. and NW. dairying and farming prevail. The state also has a large ann. fish catch, including oysters, clams, crabs, mackerel, sea trout, bluefish, and cod. Sandstone and trap-rock are quarried and some iron is still mined. The state ranks high in copper smelting and oil refining. The chief manufs. are textiles, chemicals, machinery, silks, transportation equipment, paints and varnishes, machine tools, electrical apparatus, rubber and leather goods, tobacco products, plastics, furniture, and radios. Dyeing, ship-building, printing, publishing, and paper manufacturing are also important. The state has a fine system of highways, including the N. J. Turnpike and Garden State Parkway. These connect with New York via the George Washington Bridge and the Holland and Lincoln tunnels, with Staten Is. via the Goethals and Bayonne bridges and Outerbridge Crossing, and with Delaware via the Delaware Memorial Bridge. As well as by highways the state is served by many railroads, including the Pennsylvania; Delaware, Lackawanna and W.; Erie, W. Shore, Lehigh Valley; and others. Newark has a major airport. Leading educational institutions are Princeton Univ., Rutgers Univ., Stevens Institute of Technology, Seton Hall College, and Rider College. Port Newark is a major port, and there are miles of deep-water facilities along the Hudson R. The chief cities are

Newark (438,776), Jersey City (299,000), Paterson (139,336), Trenton (128,000), Camden (124,555), Elizabeth (112,800), E. Orange (79,340), Bayonne (77,200), Atlantic City (61,650), Passaic (57,702), Union City (55,537), Hoboken (50,676), and New Brunswick (38,800). N. J. was discovered by John Cabot in 1497; it was claimed by the Dutch, but passed to Eng. hands in 1664. Pop. 4,835,330. See E. J. Fisher, *New Jersey as a Royal Province*, 1911; I. S. Kull (ed.), *New Jersey: A History*, 1930; W. J. Lane, *From Indian Trail to Iron Horse*, 1939; D. Kemmerer, *Path to Freedom: Struggle for Self-Government in Colonial New*

guard base, and maritime schools are here; a navy submarine base (Atlantic H.Q.) is at Groton, on the opposite side of Long Is. Sound. N. L. is the seat of the Connecticut College for women. The ann. rowing contest between Harvard and Yale takes place here. Pop. 30,550.

New Lynn, tn on the W. boundary of Auckland, New Zealand, on an isthmus separating the Waitemata and Manukau harbours. It owes its industrial origin to the estab. of tanneries and brick works in the early days when the dist. was remote from the city area. The spread of pop. eventually reached its borders and to-day it appears physically as part of the city



United States Information Service: American Embassy  
NEW JERSEY: THE PLAZA

*Jersey, 1706-1776*, 1940; C. S. Myers, *The Story of New Jersey* (5 vols.), 1945; J. E. Pomfret, *Province of West New Jersey, 1609-1702*, 1956. See also The N. J. Historical Society (pub.), *New Jersey Archives*.

New Jerusalem Church, see SWEDEN-BORGIAN.

New Kensington, tn of Westmoreland co., Pennsylvania, U.S.A., on Allegheny R., 14 m. N.E. of Pittsburgh. It has huge aluminium and tinplate works, and also makes magnesium sheets, glass, and electrical and metal products. There are coal-mines in the neighbourhood. Pop. 25,146.

New London, seaport city of N. L. co., Connecticut, U.S.A., at mouth of Thames R., 45 m. E. of New Haven. The harbour is one of the deepest on the Atlantic. There are manufs. of metal products, printing presses, machinery, thread, chemicals, tools, bedding, clothing, wool and paper products, and clocks. It is a port of entry and a maritime centre: the U.S. Coast Guard Academy, the coast

of Auckland. Many new industries were estab. from 1939 to 1945, and a pottery company branched out into ceramic manuf. in 1942. This branch of its activities has a daily output now of over 20,000 pieces. Besides supplying a considerable proportion of the local market, it has developed a substantial export trade in Australia. Pop. 7544.

New Mexico, state in the SW. of the U.S.A., bounded on the N. by Colorado, on the E. by Texas and Oklahoma, on the S. by Texas and Mexico, and on the W. by Arizona, was organised in 1850 and admitted to statehood in 1912. It forms part of a rocky tableland, the Rocky Mts and the Sierra Madre ranges running through it. In the E. is the Llano Estacado, a barren plain, which is being brought under cultivation by dry-farming and which rises to mt ranges in the centre of the state, the W. being mainly plateaus. It is watered by the Rio Grande and its affluent the Rio Pecos, and the tribs. of the Colorado R. The average height above sea level in N. M. is 5700 ft, the

lowest height being 2876 ft. The climate is dry, the average rainfall being only 12-16 in. Some of the land is fertile under irrigation, and agriculture is rapidly becoming an important industry of the state. The main crops produced by dry-farming are grains, whilst fruit, vegetables, and cotton are grown. Pasture is abundant, particularly on the tablelands, where stock-raising and wool-growing are important occupations. Cattle total about 1,165,000 head, and sheep about 1,400,000. Mohair production is a leading industry.



E.N.A.

A COMMUNAL CAVE DWELLING IN THE  
RIO DE LOS FRIJOLES, NEW MEXICO  
This 'house' contains 200 rooms.

There is much good forest land. The mineral wealth includes gold, silver, copper, lead, zinc, potash (80 per cent of national output), coal, granite, limestone, sandstone, marble, and petroleum. The manufs., chiefly wood products and food, are comparatively unimportant. N. M. is a popular health and tourist resort. A great attraction is Carlsbad Caverns, an enormous series of limestone chambers, now a national park. The lowest depth reached is 1350 ft, and the largest room (called the 'King's Palace') is 4000 ft long with maximum width of 625 ft, and a ceiling of over 300 ft. Below this room are 3 vast chambers known as the 'Palace of Pluto,' discovered at the 800-ft level (150 ft below the 'King's Palace') in 1939. A U.S. atomic energy laboratory is at Los Alamos, and near by, at Alamogordo, in the S. desert region, the first atom bomb was tested in July 1945. Many of the white people of N. M. are of Sp. or Mexican descent, and Spanish is still spoken.

Part of the huge Navajo Indian reservation is in the NW.; in other reservations dwell Apaches, Hopis, and Zunis. There are many Indian pueblos or vils. The cap. is Santa Fe (28,000); other centres are Albuquerque (96,815), seat of the state univ.; Roswell (25,738); Clovis (17,318); Hobbs (13,875); Las Cruces (12,325); Gallup; and Socorro. The N. M. College of Agric. and Mechanic Arts is near Las Cruces, and the N. M. School of Mines is at Socorro. N. M. is popularly called the Sunshine State. Area 121,666 sq. m.; pop. 531,800. See E. A. Powell, *The End of the Trail: the Far West from New Mexico to British Columbia*, 1915; G. P. de Villagrà, *History of New Mexico* (trans. Espinosa), 1933; L. Bloom and T. V. Donnelly, *New Mexico: History and Civics* 1933.

New Mills, urb. dist. and tn of Derbyshire, England, on R.s Goyt and Sett, 15 m. E. of Manchester; the prin. industries are textile printing, bleaching, and dyeing. Pop. 8400.

New Model, name given to the army organised by Parliament on 15 Feb. 1645. It was formed on the plan of Cromwell's Ironsides, and was under the command of Sir Thomas Fairfax, Cromwell holding the position of lieutenant-general. Its first success was the battle of Naseby, and it was the chief military instrument of the parl. victory in the Civil war.

New Monkland, see MONKLAND.

New Norfolk, tn of Buckingham co., Tasmania, 21 m. NW. of Hobart, on the R. Derwent. Pop. 5000.

New Order (or Hitler's New European Order), introduced by the National Socialist Gov. in the countries overrun by the Nazi armies (1939-41). The N. O. was defined by Funk, Ger. minister of economics, on 25 July 1941, as meaning that 'the peace-time economy must guarantee to the Greater Ger. Reich a maximum of security and to the Ger. people a maximum consumption of goods, in order to increase their welfare. European economics must be directed towards this end.' The ultimate objective of the N. O. was to turn Europe into a single economic unit, self-supporting in essentials, while trade with the outside world would be conducted by a single authority dealing directly with individual states; for the N. O. did not recognise the right of other continents to the benefits of cohesion which it claimed for itself. In brief, the N. O. involved a ruthless readjustment of European economy to suit Ger. ends and a monopoly of industrial production in Europe for the 'master people' (*Herrenvolk*). The frontiers of the Reich were so drawn as to take in the main industrial areas of Europe: Luxembourg, Alsace-Lorraine, the Czech protectorate, Silesia, and W. Poland, including the large textile industrial area of Łódź. The Reich bought up control of industries outside this central block, e.g. in Hungary, Rumania, and Yugoslavia, and probably control was estab. in some form over the industries of N. Italy. Otherwise industrial development outside the Reich was to be



suppressed, for the N. O. envisaged an agric. Europe feeding an industrial Germany. The N. O. offered certain evident attractions to the agric. or peasant states, since they would be certain of a market for their export surpluses of food and raw materials, without having to face the competition of the new world; but in fact, as Germany had manipulated the mark exchange since 1936, these satellite states would sell their exports cheaply and receive in return dear and inferior manuf. goods or nothing. The spectacle of a future Germany exercising world hegemony through economic control was reflected in her dealings with occupied countries during the war. The N. O. in action was in fact one long record of systematic terrorism (*see under* the historical sections of the various European countries concerned). It should be noted that the N. O. was originally a Jap. phrase, adapted to Jap. ambitions in the Far E., and that it was only after the phrase had been appropriated by Hitler and had fallen into disrepute in Europe that it was transmuted into 'Co-Prosperity.' But whether it be called the N. O. or Co-Prosperity, the substance was the same. It involved the conquest of all Asia, and economically it meant the subjugation to Japan of all the other members supposed to be enjoying Co-Prosperity, the weak points in which sphere were Japan's inadequacy of shipping facilities, and lack of steel, cotton, and wool.

**New Orleans**, chief city and seaport of Louisiana, U.S.A., cap. of Orleans par., on the Mississippi R., chiefly on the l. b. The largest municipal limits are co-extensive with those of the par. of Orleans, and among the suburbs are Westwego, Gretna, McDonoghville, and Algiers, its W. dist., with a riv. frontage of 3 m. The site on which the city is built is almost perfectly level and lies so low that the difficulties of drainage are great. N. O. lies below the level of the riv. at high tide and is therefore protected by an extensive series of embankments called levees. The cemeteries are a peculiar feature of N. O.; owing to the water-saturated nature of the soil, bodies are buried in vaults often 12 ft above the ground level, the coffins being ranged in tiers. In the past it was regarded as an unhealthy city, but modern scientific methods have changed this reputation. The climate is not marked by extremes of either heat or cold. The Fr. or Lat. quarter of N. O. is separated from the Amer. quarter, or New City, by Canal Street, the centre of the retail trade, and just below this street are many of the most important buildings of the city. The Custom House, built of granite, is one of the largest and most important edifices in the U.S.A. There are also the cotton exchange, city hall, criminal courts, Howard Memorial Library, the post office, sev. handsome churches, and other buildings. Tulane Univ., founded in 1834, has state support in the shape of remission of certain taxes; it has over 4000 profs. and over 4000 students. Diluted Univ., a merger of 2

colleges founded in 1869, is for coloured students. The Fr. quarter of N. O. is that part closely connected with the hist., poetry, and romance of the city, and the influence of the Fr. and Sp. regimes still survives in the mode of life, customs, holidays, and social observances. A notable feature each year is the celebration of *mardi gras* with elaborate night pageants, balls, etc. N. O. has one of the most dramatic histcs. of any U.S. city, being one of the settlements of Bienville in 1718; it was made cap. of the vast region known as Louisiana. It was ceded with Louisiana to Spain in 1763. In 1800 it fell to France, from whom it was purchased by the U.S.A. in 1803 as part of the great Louisiana purchase. In the 18th cent. N. O. rapidly grew as the outlet for riv.-borne cargoes down the Ohio and Mississippi, ever-increasing numbers of rafts and flatboats floating downward with grain, salt meat, and potash to what then was a Fr.-owned port. It was at N. O. in the war of 1812 that the Americans defeated Pakenham's veterans, one of their few successes in that war. Sugar-growing in N. O. was introduced in 1794-1795 by an enterprising creole, Etienne Boré, who set up machinery and vats and inaugurated a boom. The first steamboat to run from Pittsburgh to N. O. and back was built in 1811 by Nicholas Roosevelt of a family which was later to become famous. In the Civil War David Farragut, with a fleet of wooden sloops, forced the surrender of N. O., the Confederacy's largest and wealthiest city. The most important industries, apart from sugar-refining, are rice-cleaning and the manuf. of cotton-seed oil, iron ware, soap, cotton goods, cigars, clothing, etc. Ann. tonnage of vessels entered and cleared in foreign trade is about 5,500,000 and 4,800,000 respectively. There is a navy yard and construction and repairing estab. Pop. 570,445.

**New Pitsligo**, mrkt tn of Aberdeenshire, Scotland. 10 m. SW. of Fraserburgh. Pop. 1300.

**New Plymouth**, cap. and a port of the dist. of Taranaki, N. Is., New Zealand, 160 m. SW. of Auckland. It has an extensive harbour, and is a holiday resort with magnificent spaces including Pukekura Park. There is an airport. Pop. 28,282.

**New Pomerania**, *see* NEW BRITAIN.

**New Providence**, *see* BAHAMAS and NASSAU.

**New Red Sandstone**, *see* TRIASSIC SYSTEM.

**New River**, Eng. artificial cut or channel now about 24 m. long, stretching S. from Chadwell and Amwell, Herts, just SW. of Ware; supplied from the Lee (Lea) and from wells, and conveying these waters to works at Hornsey and Stoke Newington (N. London). Reservoirs of the Metropolitan Water Board (q.v.) at the latter hold 92 million gallons. It is no longer an original source of supply but is a very useful part of the system of supply to N. London. Begun in 1609 by Sir Hugh Myddelton, it was completed in 1613, discharging into a Round Pond at N. H.

**Head.** The N. R. Co. was incorporated in 1819, Hugh Myddelton being its first governor. The property was originally divided into 72 shares (of £100 each), 36 being 'adventurers' shares' held by Myddelton and 28 others, and the remainder held by King James I in return for financial aid in the construction of the N. R. Charles I exchanged these (1631) for an annuity of £500 (King's or Crown Clog), the payment of which, after deduction of tax, is still annually made by the Metropolitan Water Board. The shares were in later years valued at over £100,000 each. The Metropolitan Water Board took over the undertaking of this and of 7 other water companies in 1904.

**New River (U.S.A.),** see KANAWHA.

**New Rochelle,** residential city of Westchester co., New York, U.S.A., on Long Is. Sound, 18 m. NNE. of New York. It manufs. plumbing and heating equipment, pharmaceuticals, and wood and metal products, and is the seat of the College of N. R. and Iona College. The house of Thomas Paine is also here. Pop. 59,725.

**New Romney,** see ROMNEY, New.

**New Ross,** mkt tn of co. Wexford, Rep. of Ireland, 23 m. W. of Wexford, on the R. Barrow. It is one of the oldest tns in the co. and was the scene of patriot resistance in 1798. It is now a prosperous industrial centre, but retains its medieval appearance. Pop. 5000.

**New Russia,** obsolete name for the steppe area N. of the Black Sea and the Sea of Azov which in the 18th and early 19th cents. was acquired by Russia, mostly conquered from Turkey, and populated by colonists from various parts of Russia as well as from the Balkans and Germany. It comprised the present Moldavian Rep., the oblasts of Odessa, Nikolayev, Kherson, Kirovograd, Crimea, Dnepropetrovsk, Zaporozh'ye, Stalino, and Voroshilovgrad of the Ukraine, and parts of the Rostov Oblast and Krasnodar Krai of the Russian Federal Rep. See also BESSARABIA.

**New Sarum,** see SALISBURY.

**New Serbia,** in 18th cent. the name of a part of New Russia (q.v.) W. of the Dnieper, partly populated by Serbian colonists (1752-3). It comprised the present Kirovograd and part of Dnepropetrovsk oblasts with Novomirgorod as cap. The Serbian colonists are now completely assimilated.

**New Siberian Islands,** see NOVOSIBIRSKIYE OSTROVA.

**New South Shetlands,** group of is. in the Antarctic Ocean, see SOUTH SHETLANDS.

**New South Wales,** oldest state of the commonwealth of Australia, in the SE. portion of the is. continent, extending between lat. 28° 10' and 37° 28' S., and 141° and 154° E., with an area of 309,433 sq. m., and a coastline of over 700 m. There are 103 municipalities and 133 shires. Within the state of N. S. W. the mt range which girdles nearly the whole is. is most continuous and elevated, and is known as the Dividing Range. The section of this mt system on the S. boundary, called the Australian Alps, rises

in Mt Kosciusko to 6500 ft. From this the range extends northward, the watershed being from 50 to 150 m. distant from the E. coast, and thus divides the state into 2 slopes, with 2 distinct water-systems. The rivs. on the E. side descend with great rapidity, and in oblique tortuous courses, their channels often forming deep ravines. Many of them are navigable in their lower course for sea-going steamers. The prin. are the Richmond, Clarence, Macleay, Manning, Hunter, Hawkesbury, and Shoalhaven. The Hunter R., about 60 m. N. of Sydney, opens up one of the most fertile and delightful dists. in the country. The Dividing Range, which opposite to Sydney is called the Blue Mts, being singularly abrupt and rugged, and full of awe-inspiring chasms, long presented an impenetrable barrier to the W., and kept the colonists shut in between it and the sea, and utterly ignorant of what lay beyond. At last, in 1813, when the cattle were likely to perish in one of those long droughts that appear to visit this country at intervals of a dozen years, some adventurous individuals scaled the formidable barrier, and discovered those downs on the W. slope which now form the great sheep-ranges of Australia. A practicable line of road was immediately constructed by convict labour, and the tide of occupation entered on the new and limitless expanse. The numerous streams that rise on the W. side of the watershed within the state all converge and empty their waters into the sea through one channel within the state of S. Australia. The S. and main branch of this great riv. system is the Murray. The other great trunks of the system are the Murrumbidgee, which is navigable, the Lachlan, at times reduced to a string of ponds, and the Darling. The Macquarie, passing through the rich dist. of Bathurst (q.v.), is a large trib. of the Darling, but it reaches it only in the rainy seasons. Numerous good harbours are formed by the estuaries of the rivs.

Owing to the great extent of the state, stretching as it does over 11 degrees of lat., the climate is very varied. In the N. dists., which are the warmest, the climate is tropical, the summer heat occasionally rising in inland dists. to 120°, while on the high tablelands weeks of severe frost are sometimes experienced. At Sydney the mean temp. of the year is 65°. The mean heat of summer, which lasts here from the beginning of Dec. to the end of Feb., is about 80°, but is much modified on the coast by the refreshing sea breeze. The ann. fall of rain is about 50 in. Prolonged heavy rains periodically result in widespread floods along the course of the riv. systems.

N. S. W., although mainly dependent on primary industries (chiefly agriculture and grazing) for her export income, is now highly industrialised, and about one-third of the work force is in manufacturing industries. The prin. crops are wheat, maize, barley, oats, and vegetables, and fruit-growing has greatly developed in recent years—oranges, apples, and peaches

predominating. In 1954-5 there were 5,394,012 ac. under crops. The area under wheat was 2,918,670 ac. (37,718,000 bushels); oats, 657,292 ac. (7,667,169 bushels); maize, 50,617 ac. (1,767,258 bushels); lucerne (hay), 192,196 ac.; rice, 38,688 ac. (5,080,107 bushels); barley, 36,866 ac.; potatoes, 13,897 ac.; tobacco, 635 ac. The area under grapes was 18,205 ac.; citrus fruit (principally oranges), 32,065 ac. (3,585,757 bushels);

£A78 million, including 15 million tons of coal valued at £A43 million.

The staple exports are wool and wheat. The other prin. exports are butter, lead, coal, skins and hides, tallow, frozen biscuits, confectionery, fruit (fresh and preserved), wines and leather, timber, copper, tin, and zinc. The value of exports overseas in 1954-5 was £A220,657,000, and of imports from overseas £A346,030,000. The manufs. of the



*Australian News and Information Bureau*

#### NEW SOUTH WALES

##### BROKEN HILL, THE RICHEST SILVER, LEAD, AND ZINC MINE IN THE WORLD

Looking north along the line of lode, the Broken Hill South Ltd mine is seen in the foreground; behind it is the mile-long vast Open Cut, now worked out. To the right is the central power station which supplies all the mines with electricity.

other fruit, 59,059 ac. Sugarcane produced 222,213 tons of sugar. The recognition of the fact that the cultivable area might be greatly extended by a system of water conservation and irrigation has induced the gov. to undertake various detached works and schemes, which are designed to constitute a portion of the system necessary to serve the whole state. The most striking of these is the Murrumbidgee (q.v.) scheme with a storage dam across the Murrumbidgee at Burrinjuck. Enormous areas are utilised for grazing purposes—in 1955 there were 3,500,000 cattle and 59 million sheep which produced over 540 million lb. of greasy wool. The state is rich in mineral deposits, especially coal; silver, lead, and zinc are mined at Broken Hill (q.v.). In 1954 the value of minerals produced was

state are varied and numerous. The chief industrial products are industrial metals, machines, etc.; clothing, food and drink, and tobacco; chemicals, paint, and oil; wood-work, paper, printing, textiles and textile goods (not dress), skins, and leather (not footwear). Large iron and steel works with subsidiary factories are in operation near the coal-fields at Newcastle and Port Kembla. The products include iron and steel of various grades, boilers, pipes, wire, brass cables, etc. The value of the output of all manuf. goods in 1954-5 was £A1446 million. Sydney (pop. 1,897,710) is the cap. Other important tns are Newcastle, urban area, 181,740; Greater Wollongong, 95,830; Broken Hill, 32,000; Blue Mts, 23,330; Maitland, 21,630; Goulburn, 19,740; Wagga-Wagga, 18,640; Penrith, 18,790;

*Orange*, 18,570; *Lismore*, 17,620; *Albury*, 17,100; *Bathurst*, 16,390; *Lithgow*, 15,270; *Cessnock*, 14,630; *Grafton* and *S. Grafton*, 14,410; *Tamworth*, 13,940; *Dubbo*, 12,370; *Campbelltown*, 10,120; *Armidale*, 8,860; *Parkes*, 8,100; *Casino*, 8,000; *Inverell*, 7,680; *Kempsey*, 7,740; *Taree*, 7,610; *Queanbeyan*, 7,550; *Cooma*, 7,240. Sydney is the H.Q. of the squadron in Australian waters, and is the seat of 2 univs. A bridge across Sydney harbour, one of the largest arch bridges in the world, was opened in Mar. 1932. Education is compulsory between the ages of 6 and 15 years. The railways and tramways are mostly state-owned. On 30 June 1955, 6101 m. of gov. railway were open. N. S. W. took its origin in a penal estab. formed by the Brit. Gov. in 1788 at Port Jackson, near Botany Bay (lat. 34°). The prisoners, after their period of servitude, or on being pardoned, became settlers, and obtained grants of land. Transportation to N. S. W. ceased in 1840, and up to that date the total number of convicts sent thither amounted to 60,700, of whom only 8700 were women. They were assigned as bondservants to the free settlers, who were obliged to furnish them with a fixed allowance of clothing and food. In 1843 a practically elective legislative council was estab., and 12 years later responsible gov. was granted. The constitution is based on the Consolidating Act of 1902. Parliament consists of 2 Houses, the legislative council and the legislative assembly. The council, once a nominated body, was reconstituted after the referendum of May 1933, and now consists of 60 members. Of these, one-third retire every 12 years, and the remaining members, together with the members of the legislative assembly, vote to elect new members to the council. Voting is by the proportional preferential system. Council members receive an ann. allowance of £A500. The assembly consists of 94 members who are paid a salary of £A1875 a year. The duration of a Parliament is limited to 3 years. The Women's Legal Status Act, 1918, gives women the same political rights as men. The executive is in the hands of a governor, appointed by the Imperial Gov., and an executive council consisting of members of the Cabinet. The pop., 31 Dec. 1955, was 3,525,923. See *Official Year Book of New South Wales* (ann.); *New South Wales Pocket Year Book*; also A. G. Foster, *Early Sydney*, 1920, and E. Mitchell, *Australia's Alps*, Sydney, 1942.

**New South Wales Government Railways.** The first section of this system was opened by a private company in 1855, but soon taken over by the gov. of New S. Wales, which thereafter built almost all the lines in the state. The present system includes the S. line and branches (from Sydney to Wallangarra); the W. line and branches; and the N. Coast line linking Sydney and Brisbane by a continuous line. The gauge is 4 ft 8½ in. and 6113 m. are open.

The Federal Cap. Ter. Railway (Queanbeyan-Canberra), on completion, was taken

over by the chief commissioner of railways for New S. Wales, who worked the line on behalf of the Commonwealth Gov. until 1928, when the management was taken over by the Commonwealth railway commissioner. New S. Wales Railways rolling stock is used. It connects with the New S. Wales railway system at Queanbeyan and is about 5 m. in length.

**New Stars**, see **NOVAR.**

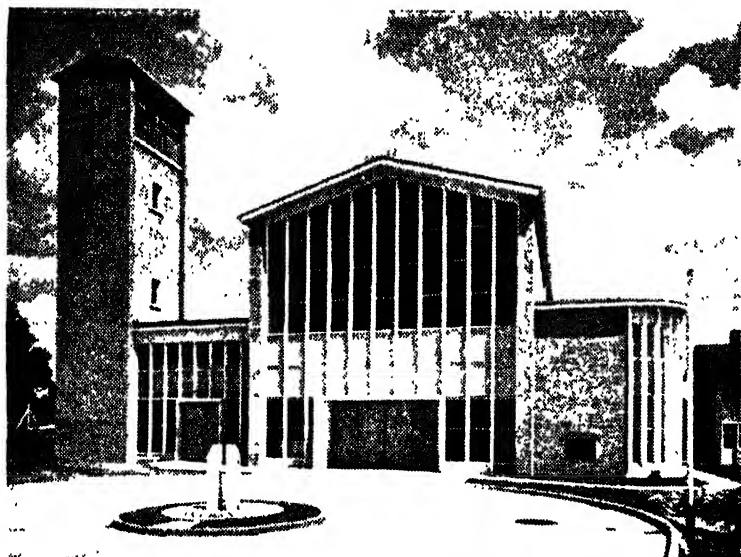
**'New Statesman'**, independent Eng. weekly periodical formed in 1931 by the amalgamation of 2 papers, the *N. S.* and the *Nation and Athenaeum*. In 1934 the *Week End Review* was also taken over and its name now appears as a subtitle to the *N. S.* The *N. S.* was founded in 1913, through the inspiration of Sidney Webb (later Lord Passfield) and Bernard Shaw. The *Nation* was founded in 1907, superseding the *Speaker* (founded 1890). In politics the *Nation* followed the *Speaker* in supporting the extreme radical wing of the Liberal party. In 1921 the *Nation* amalgamated with the *Athenaeum* (q.v.). The present combined paper, which has since achieved a record sale for this class of pub., is a political and literary review, markedly to the left in politics.

**New Stone Age**, see **STONE AGE.**

**New Testament**, see **BIBLE.**

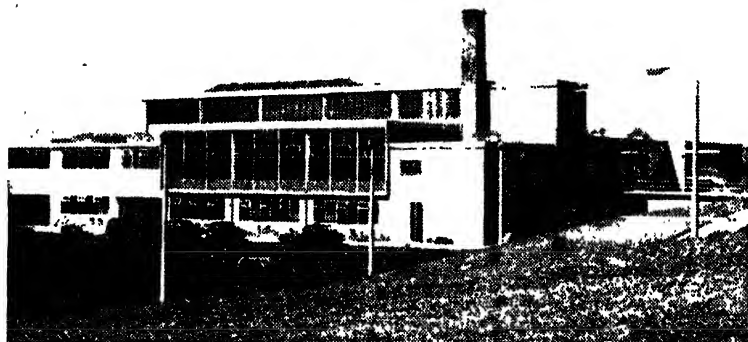
**New Theatre**, St Martin's Lane, London, was opened 12 Mar. 1903, under the management of Charles Wyndham and Mary Moore. The following are among the best-known plays produced at the N. T.: *Saint Joan*, 1924; *The Constant Nymph*, 1926; *Richard of Bordeaux*, 1932; *Noah*, 1935; *The Gioconda Smile*, 1948; *The Cocktail Party*, 1950; *Under Milk Wood*, 1956; *The Summer of the Seventeenth Doll*, 1957. Between 1935 and 1947 the N. T. was the scene of sev. notable Shakespearian productions with Laurence Olivier and John Gielgud in the title roles.

**New Towns.** The New Towns Act, 1946, provides for the creation of N. T. by development corporations appointed and financed by the gov. Up to 1958 12 such tns had been started in England and Wales and 3 in Scotland. Though there are many examples in list, of N. T. founded for military or political reasons, or in colonies, the modern conception arises from the advocacy of garden cities (q.v.), the pioneer enterprises of Letchworth and Welwyn, and the recommendations of the Barlow Report, 1940, for urban dispersal (see **TOWN AND COUNTRY PLANNING**). Just before the Act the N. T. (Reith) Committee had submitted 3 reports (1946) dealing with almost every aspect of new-town planning and development; they suggested, among other things, that N. T. might be built by a variety of agencies, including corporations sponsored by large local authorities, and authorised associations, as well as by the gov. The Act, however, provides only for gov. sponsored development corporations. The sites are chosen and designated by the minister (now in England and Wales the minister of housing and local gov., and in Scotland the secretary of state for Scotland). Many sites were investigated



*Stevenage Development Corporation*

ST JOSEPH'S ROMAN CATHOLIC CHURCH, BEDWELL, STEVENAGE NEW TOWN



*East Kilbride Development Corporation*

EAST KILBRIDE NEW TOWN: PRINTING WORKS

before decisions were made. Of the 14 sites designated between 1946 and 1950, 8—Basildon, Bracknell, Crawley, Harlow, Hatfield, Hemel Hempstead, Stevenage, and Welwyn—are in the outer country ring of Greater London and intended to receive 'overspills' of industry and persons from the metropolis. Corby (Northants) is primarily for housing workers in a rapidly expanding steel works, as well as in some new factories. Aycliffe (Durham) is for workers in an industrial trading estate (q.v.) developed during the war. Cwmbran (S. Wales) is mainly to serve industries already estab. there. Peterlee (Durham) is designed as a new centre to gather a scattered mining pop. E. Kilbride (Lanarkshire) is to cater for part of the large expected overspill from Glasgow. And Glenrothes (Fife) is mainly to serve a new coal-field. All the tns strive for a variety of industry and a 'balanced' pop. In 1956 the fifteenth new town site was designated at Cumbernauld (Dunbarton), for Glasgow overspill. The areas of land designated vary from 880 ac. at Aycliffe to 10,250 ac. at E. Kilbride; this land is subject to compulsory purchase as required for development. Target populations range from 20,000 at Aycliffe to 80,000 each at Basildon and Harlow. The original pop. of the areas of the 15 N. T. was about 134,000, and they are to be expanded by about 558,000 to a total of about 692,000.

For each in a separate development corporation is appointed (except that the same members serve for both Hatfield and Welwyn); the maximum is 9 members, of whom at least 1 is a local resident. The corporation appoints a qualified staff and prepares a careful survey and master plan, followed by detailed plans for each part of the tn. Finance for general development, and much of the housing, shops, and factory buildings, is advanced by the Exchequer to the corporations; schools

are provided by the co. councils, some housing and public services by local authorities, churches by religious bodies, public houses and some factories and shops by private enterprise, and some houses by owner-occupiers, on land leased or purchased from the corporations.

Considerable progress has been made by the first 14 tns. By the end of 1957, 298 industrial firms had occupied 10½ million sq. ft of factory space; 231,500 persons had been newly housed in about 75,900 dwellings; 118 new schools had been built for 55,000 pupils; and 1113 new shops completed. The expenditure by the corporations to Dec. 1957 was about £195 million, of which about £121 million was on housing. Most of this capital expenditure has proved remunerative. Up to 31 Mar. 1957 there was an accumulated revenue deficiency of £1.9 million, but the ann. deficiency of the 12 tns in England and Wales was diminishing, and in the years 1955-7, 6 of the tns showed a revenue surplus.

The planning, architecture, and landscaping of the N. T. are a great advance on older industrial tns. In detail of layout they vary considerably; some are criticised as too open, some as too compact; in most the standards of housing density, roads, space for schools and playing fields, etc., are those currently accepted in Great Britain as desirable. All show at an early stage much vigour as communities; voluntary societies spring into being more rapidly than meeting places and other facilities can be provided for them, and this is a topic of some agitation. In social composition there is a more than average preponderance of the younger age groups and of industrial workers; the tns seek therefore to attract commercial as well as factory employment, and to increase the proportion of houses for owner-occupiers.

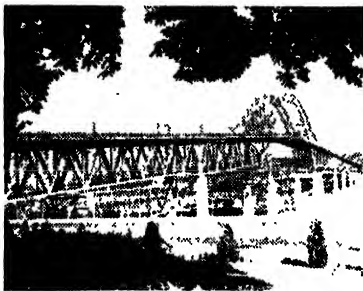
*Country town development.* Substantial as the N. T. programme is, it is not

STATISTICS OF 14 NEW TOWNS

Name	Corporation Appointed	Designated		Capital Expenditure to Dec. 1957 (£000)
		Area (acres)	Population (proposed)	
LONDON RING				
Basildon	Feb. 1949	7,834	80,000	19,627
Bracknell	Oct. 1949	1,860	25,000	9,855
Crawley	Feb. 1947	6,000	50,000	27,750
Harlow	May 1947	6,320	80,000	31,310
Hatfield	June 1948	2,340	25,000	5,600
Hemel Hempstead	Mar. 1947	5,910	60,000	23,300
Stevenage	Dec. 1946	6,100	60,000	22,970
Welwyn	June 1948	4,317	50,000	10,950
OTHER AREAS				
Corby	May 1950	2,677	40,000	5,500
Cwmbran	Nov. 1949	3,160	35,000	7,240
E. Kilbride	Aug. 1947	10,250 *	50,000	13,582
Glenrothes	Oct. 1948	5,730	32,000	4,168
Newton Aycliffe	July 1947	880	20,000	6,324
Peterlee	Mar. 1948	2,350	30,000	6,600

\* Area to be built up, 2,500 ac.

considered sufficient to take the overspill anticipated from the proper redevelopment of congested city centres. Estimates of probable displacement in 15 years from 1956 range from 2 million persons to 4 million. As a measure supplementary to the New Towns Act, the Town Development Act was passed in 1952 (for England and Wales only). This provides for arrangements between local authorities for the transfer of pop. and employment from congested cities to smaller towns and county dists. capable of planned expansion, with financial aid from the Exchequer. Early schemes under this Act were for the expansion of Bletchley by 10,000 and of Swindon by 20,000 persons (from London). By 1958 many other schemes had been agreed or discussed for transfers to various places from London, Birmingham, Merseyside, and Bristol. The obvious need of greater speed in dispersal gave rise to pressure for more adequate grants to 'receiving' authorities under the Act, and for the building of more N. T. under the New Towns Act of 1946. See *Reports of New Towns Committee* (3), 1946; *Town and Country Planning* (special N. T. issues), Jan. 1951 on; G. M. D. Block, *The Spread of Towns*, 1954; Norman Mackenzie, *The New Towns: the Success of Social Planning*, 1955; *Reports of Ministry of Housing and Local Government*; and books under GARDEN CITIES. See also OVERSPILL.



Agent-General for British Columbia  
THE PATTULLO BRIDGE OVER THE  
FRASER RIVER AT NEW WESTMINSTER

**New Westminster**, city of Brit. Columbia, Canada, former cap. of the colony, on the r. b. of the Fraser R., here crossed by a fine bridge. It is served by the Canadian National and Canadian Pacific Railways, and by the Great N. from the U.S.A.; an electric railway connects it with Vancouver, 12 m. ESE. N. W. was founded by the Royal Engineers in 1859 and incorporated in 1860. A fire occurred in 1898, when a large part of the city was destroyed. The fresh-water harbour is third among Canada's seaports, the chief exports being lumber, lead bars, ores, and fruit. Manufactures include wood products, paper, fertilisers, and cordage; meat-packing and canning are also carried on. Pop. 31,357.

**New Year's Day** has been celebrated in all parts of the world, and from remote antiquity, with special festivities. Its date has, however, varied considerably. The New Year of the anc. Egyptians and Persians began with the autumnal equinox (1 Sept.). The Jews (eccles.) and the Babylonians made it begin with the spring equinox. The Greeks (until the 5th cent. BC) celebrated it at the winter solstice. During the Middle Ages, Christian countries almost invariably began the New Year on 25 Mar. According to the Julian calendar (q.v.), N. Y. D. was 1 Jan., and the Romans observed this day as a general holiday. Visits were paid and presents exchanged. The gifts were known as *strenae* (cf. the name for N. Y. D. in France, *le jour d'étrennes*), and so great were the imperial *strenae* that they ultimately became a subject of legislation. The early Christians were not expected to take part in either the new year's revels or the Saturnalia of Dec., and many of the fathers order N. Y. D. to be kept as a fast. But the need for this vanished, and even in England the custom of giving New Year's gifts continued down to the time of Charles II. It has now been superseded by the custom of giving Christmas presents. The date is observed as the Feast of the Circumcision (q.v.).

**New York, Chicago and St Louis Railroad**, important railway company operating 2185 m. of track in the busy N.E. areas of the U.S.A. It was incorporated in 1923 as an amalgamation of sev. lines, including the N. Y., C. and St L. R.; the Chicago and State line; the Toledo, St Louis and W.; the Lake Erie and W.; and the Fort Wayne, Cincinnati, and Louisville. At one time a large part of the line was operated by the New York Central Railway. It is usually known as the Nickel Plate Road.

**New York, New Haven and Hartford Railroad Company** was incorporated in 1872, and now operates 1771 m. of track in one of the most densely populated areas of the E. states of America. Some 127 m. of the New York-Boston main line are electrified. A subsidiary company operates bus and lorry services.

**New York Bay.** The Lower (outer) Bay is that part of the Atlantic which washes the converging shores of Staten Is. and Brooklyn. Between these is, runs a strait called The Narrows, through which the Upper (inner) Bay is reached. This is some 6 m. wide and 7 m. long, and at its inner end are the mouths of the Hudson and East Rs., with Manhattan Is. and New York City lying between them.

**New York Central System** was started as a large railway combine in 1868. It is now one of the largest railways in America, and has a total mileage of 10,714, including affiliated lines; the main line runs from New York to Chicago, but it has important branch lines and connects with most of the E. states railway systems. The operating revenue in 1952 was \$806,926,218.

**New York City** originally was the is. of Manhattan; but greater New York includes the bors. of Manhattan, Bronx,

Brooklyn, Queens, and Richmond. New York disputes with London the claim to be the largest city in the world. Taking a radius of 25 m. New York is the centre of a larger pop. (12,831,950). It has more Germans living in it than many large cities in Germany, more Irish than Dublin, and more Italians than most big Italian cities. There is also the great transitory pop. which is always a feature of large ports. The Negro pop. is the largest of any city. The Jews are chiefly Polish and Russian. Chinese, Swedes, and Norwegians have each

U.S.A., and is the commercial and financial metropolis of the States. The Stock Exchange, the building designed by George B. Post, and completed in 1922, is in Wall Street, a narrow street leading E. out of Broadway, which forms an E.-W. street across lower Manhattan, and across which run the avenues. Fourth and Fifth Avenues were mostly residential, and here were the palatial homes of the business kings, but in recent years many of the old houses have given way to commercial buildings. The prin. shopping dist. is from 32nd to



*Aerial Exploration Inc.*

**NEW YORK: A VIEW LOOKING SOUTH-WEST, SHOWING SOUTH MANHATTAN**

Upper Bay is on the left; behind the skyscrapers are the Hudson River and Jersey City. In the foreground (East Side) is Manhattan Bridge; beyond it Brooklyn Bridge and the main financial district of Manhattan.

a strong colony in N. Y. C., and are prosperous, quiet, working citizens. Owing to the size of Manhattan Is. (12 m. in length and very narrow), skyscrapers have been erected. The Empire State soars up 102 storeys, attaining a height of 1473 ft. and is the tallest structure in the world. Other notable ones are the Chrysler building (1046 ft high); the Chanin Tower (680 ft high); the Woolworth building (792 ft high); the Singer Co.'s building (612 ft high); and the New York Telephone building in W. Street (498 ft high). Skyscrapers of from 35 to 50 storeys have now become a commonplace in N. Y. C. The Waldorf-Astoria hotel, with its twin towers reaching over 625 ft. is the biggest hotel in the world. The New Yorker is another notable skyscraper hotel, reaching a height of 470 ft. N. Y. C. is the great mart and exchange of the

57th Street. Bowery, extending N. of Chatham Square, is one of the poorer parts of the city. Four lines of railway have termini in Manhattan, including the New York Central and the Pennsylvania. They have the 2 finest railway stations in the world. Eight other lines have termini across the Hudson R. in New Jersey and convey their passengers to N. Y. C. by ferry or bus or tube trains. There is a vast underground railway along the whole of Manhattan Is., and extending to the Bronx, Brooklyn, and Queens. New York is the largest port in America, more than half the import and export trade of the U.S.A. coming by way of this city. New York harbour, formed by the North and the Hudson, consists of 2 bays, the Upper and Lower, divided by The Narrows, and bounded on the SE. by Raritan Bay, NE. by Brooklyn and Long Is. Sound. The



promontory of Sandy Hook with light-house is the first land sighted by European travellers. The enormous statue of 'Liberty enlightening the World,' by Bartholdi, stands on Bedloe's Is., and has a pedestal of 150 ft. The water communication of the Hudson R. and the New York State Barge Canal is of the utmost importance, for much of the wheat sent from Chicago market is thus shipped to Europe. Many of the piers are on the New Jersey side at Hoboken. The U.S. naval shipbuilding yards are on the Brooklyn side, where there are extensive docks and 36 m. of improved water-front. The ferries crossing the river are of immense size. The city is noted also for its daily papers, over one-seventh of which are printed in foreign languages; 2 are in Yiddish. Columbia Univ. was founded as King's College on the result of a public lottery in 1754. Its present site is on Morningside Heights and it includes Barnard College for women. New York Univ., one undergraduate dept of which is on Univ. Heights, was founded in 1831. It is a huge organisation and is divided into 3 centres, the undergraduate dept, the school in Washington Square, and the school of commerce in Trinity Place. The New York College, whose buildings were completed in 1900, has a policy of free education. Fordham College has developed from a theological seminary into a complete univ. The New York Public Library, estab. by consolidation of the Astor, Lenox, and Tilden foundations, was opened in 1911. The Bellevue Hospital Medical School is the largest medical school in America. There are over 550 churches: Trinity, at the head of Wall Street, Grace Church, the Church of the Transfiguration (Episcopalian), the vast and costly cathedral of St John the Divine on Morningside Heights, St Patrick's Cathedral (Rom. Catholic), Christ Church on Park Avenue (Methodist), and the fine Jewish synagogues are all notable.

As most business from the 19th cent. centred in Manhattan Is., and as the whole area was very narrow, the only way of expansion was in the air. Hence, after skyscrapers were invented, New York developed them to their highest pitch. The early ones, like the Pulitzer and Flat Iron buildings, to-day look almost like pygmies compared with those erected subsequently. In order to provide for light and air, the new building laws require the step-back or terraced form of building, which gives to these enormous structures something of a Babylonian aspect. The time is probably rapidly approaching when most of Manhattan will consist of skyscrapers. Wall Street section—the financial dist.—is filled with them. Another great group was constructed between 30th and 60th Streets, and many avenues are lined with them. There is one group devoted to the clothing and needle trades, another to medical schools and hospitals. Skyscraper hotels are the fashion in New York. Most of the modern ones range from 18 to 50 storeys high, and have

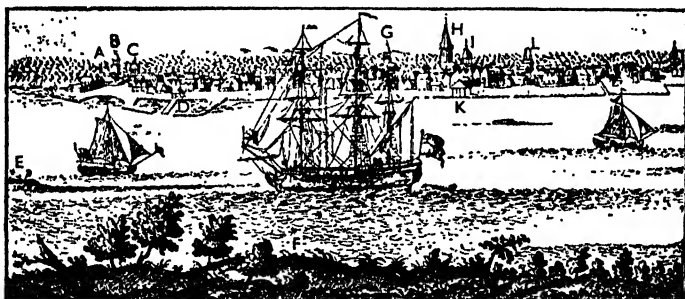
from 750 to 2200 bedrooms, each with private bath. The vast working pop., accumulated in the skyscrapers during the day, has made the traffic problem the most difficult in the world. In the morning and evening the streets are congested with motor vehicles, the sidewalks with pedestrians travelling to bus lines or underground, there known as the subways. The city has not been able to build its subways fast enough to accommodate the crowds.

New York possesses at least 2 thoroughfares which are world famous—Broadway and Fifth Avenue. The latter is the great retail, shopping, and club avenue. Broadway, between 39th and 60th Streets, is the centre of the theatrical and night life. It is the section known as the Great White Way, because of the vast series of electric advertising signs which almost turn night into day. In some aspects N.Y.C. is the city that never sleeps. Buses and subways run all night; there are countless drug stores and restaurants which never close their doors, and there are cinemas which have performances which start at midnight. Central Park is 840 ac. in extent, and has many magnificent drives and walks. The Metropolitan Museum of Art faces the E. side of the park. It is one of the greatest in the world and was greatly enriched by the princely legacies of Benjamin Altman, J. Pierpont Morgan, and Felix Warburg. The city frontage on the Hudson R. from 72nd Street northwards has been made into a beautiful scenic driveway, Riverside Drive, which is bordered by the W. Side Highway. In Brooklyn the prin. park is Prospect Park, famous for its gardens. That part of the city known as the Bronx contains the huge Bronx Park, in which is located a zoo, the richest and one of the largest and best equipped in the world. New York Harbour has 771 m. of waterfront, and the city is served by La Guardia, New York International (Idlewild), Newark, and Teeterboro airports, truck freight lines, and many state and interstate bus systems. A system of express highways links N. Y. C. with neighbouring cities and the bors. with one another. Internal transportation includes connected underground systems, linking all the bors. except Richmond, as well as bus and trolley lines and the largest fleet of taxicabs in the nation. Among New York's bridges are the George Washington, Henry Hudson, Brooklyn, Bronx-Whitestone, Triborough, Queensboro, Hell Gate, Williamsburg, and Manhattan. Lincoln and Holland tunnels and railroad tunnels pass beneath the North R., and Queens-Midtown Tunnel, subway tubes, and Brooklyn Battery Tunnel pass under the East R. Plans for a bridge between Brooklyn and Staten Is., over The Narrows, have long been under discussion. The chief industries are the manuf. of cloth (a quarter of the national output), fur goods (90 per cent of the national output), hats, leather goods, jewellery, printing and publishing; food processing, metal-working, the manuf. of drugs and medicines,

machinery, wood products, textiles, and scientific and precision instruments; automobile assembling, and shipbuilding and repairing. On Manhattan Is. the tendency is for private houses to become impossible except for people of wealth, and for the dense pop. to live in ever larger and more elaborate 'apartment houses.' Pop. (1950) Manhattan, 1,960,100; Brooklyn, 2,738,175; Bronx, 1,451,277; Queens, 1,550,489; Richmond, 191,555; total 7,891,596. See TAMMANY HALL.

*History.* In 1609 Henry Hudson discovered the riv. named after him and also the is. of Manhattan. In 1624 Peter Minuit, appointed director of Dutch colonies in America, arrived at Manhattan and bought the entire is. from the Indians for 24 dollars' worth of beads

Eng. colonies in America, but also from Europe, so that by 1643 some 18 languages were being spoken there, and the future of N. Y. C. was thus already marked by a cosmopolitan character which was to make it unique. The famous Peter Stuyvesant, with his wooden leg, was the last Dutch governor of the settlement. Under him the restlessness of the people came to a head. They wanted a voice in their own gov., strengthened in this by what they saw going on in the neighbouring Eng. colonies. The home company finally decided that the governor should have a council of 9, chosen from a larger number selected by the people. Nevertheless, he managed to keep things very largely in his own hands until fate eventually overtook him. In 1664, England claiming the



NEW YORK IN 1746

A, The Fort; B, The Chapel; C, Secretary's Office; D, The Great Dock; E, Part of Nutton Island; F, Part of Long Island; G, Dutch Church; H, English Church; I, City Hall; K, The Exchange; L, French Church.

and ribbons. To-day that is. is the most valuable piece of land in the world. Thus began what was to be the modern Babylon. It was governed by Minuit and a council of 5 appointed by the Dutch W. India Co. in Holland. The people had no voice in their gov. At first growth was very slow, and at the end of 5 years there were but 300 people living in the tn, which was named New Amsterdam. The home company, desiring to attract settlers, in 1629 adopted the patron system. Under this any member of the company who would bring or send at least 50 settlers, 15 years old or over, would be granted an estate of 16 m. of frontage on the Hudson R., and as far back as his resources would permit him to develop. The patron was bound to provide a farm for each of his tenants, who in their turn were bound to remain on it for 10 years. The more powerful of these patrons became immensely wealthy, and in after years formed what was known as the Knickerbocker aristocracy of N. Y. C. It included such well-known names as the Van Rensselaers, Schuylers, and Livingstons.

New Amsterdam now began to grow, and attracted people not only from the

colony on the ground of the Cabot discoveries, King Charles II presented the entire surrounding country to his brother, James, Duke of York. Richard Nicolls of the R.N. set out with 500 veteran soldiers. On reaching New England, he was joined by Eng. colonial militia from Connecticut and sailed for the mouth of the Hudson. Stuyvesant wanted to fight but the people were not with him, and he was compelled to surrender the tn, which was at once named New York. Old Stuyvesant retired to his farm or 'hovel'—after which that famous dist. of N. Y. C. is named—and later became fast friends with Governor Nicolls. Nine years later a Dutch fleet reconquered New York, but the next year by peace treaty it was returned to the English. Under the English N. Y. C. became a busy mart containing over 10,000 people by 1750.

In the late 18th cent., before the revolution, New York had prospered and developed more than any other Amer. city, though both Philadelphia and Boston were equally important ports. New York owed its position to the fact that it was the natural outlet and cap. of the Middle Colonies (see on this J.

Truslow Adams, *The Epic of America*, 1942). Already it had a more mixed and polished society than anywhere else on the E. coast, though some historians claim that Boston far outstripped it as the literary cap. of the U.S.A. even as late as the first half of the 19th cent., and that in the late 18th cent. it was rivalled by Philadelphia for commerce. John Adams, on his way to staid Philadelphia, was impressed by the splendid houses, fine salons, and elaborate cuisines. At this period the city had its clubs, balls, concerts, pleasure gardens, and coffee-houses. A funeral in New York sometimes cost sev. thousand dollars, and the wealthy people dressed in the latest London modes, with silks and velvets, powdered wigs, and small swords (see A. Nevins and H. S. Commager, *America*, 1943). There were grammar schools but no general system of instruction. King's College (now Columbia Univ.) trained Alexander Hamilton and Gouverneur Morris, but wealthy families sent their sons to the Brit. univs. At this time (1790) the pop. was 33,000. The year 1789 saw New York developing temporarily into a national cap., and President Washington at first occupied a residence just outside the city on Franklin Square and then later took an imposing mansion (McComb) in Lower Broadway, while Vice-President Adams occupied a large house on Richmond Hill. Congress sat at both Wall and Broad Streets. In the 1830's the new Amer. classes converted the city from a federated to a democratic city. To-day New York stands unchallenged as the marine, commercial, financial, journalistic, and literary metropolis of the New World. See J. G. Wilson, *Memorial History of the City of New York*, 1891-3; M. J. Lamb and B. Harrison, *History of the City of New York: Origin, Rise, and Progress*, 1896; Mrs S. Van Rensselaer, *History of the City of New York in the Seventeenth Century*, 1909; R. L. Warshaw, *The Story of Wall Street*, 1930; E. W. Spaulding, *New York in the Critical Period 1783-9*, 1932; C. Beaton, *Portrait of New York*, 1948; A. Nevins and J. A. Krout, *The Greater City—New York, 1898-1948*, 1948; Nagel Guides, *New York*, 1955.

**New York City Transit System.** The N. Y. C. T. S. was formed in June 1940. The city, through its Board of Transportation, had built the independent city subway and operated it since the opening in 1932. In 1 June 1940 the board took over the Brooklyn-Manhattan Transit Corporation and its subsidiary the New York Rapid Transit Corporation, tramways operated by the Brooklyn & Queens Transit Corporation, and buses operated by the Brooklyn Bus Corporation. The railways of the Interborough Rapid Transit Co. and of the Manhattan Railway Co. were acquired on 12 June 1940. Other bus routes were taken over in 1947 and 1948. The city of New York has leased to the New York City Transit Authority for not less than 10 years from 15 June 1953 all properties, etc., formerly operated by the Board of Transportation.

There are 237 m. of electric railways, subway and elevated, 48 m. of tramway and trolleybus routes, and 526 m. of bus routes.

'**New York Herald**' was founded 6 May 1835, by James Gordon Bennett, in New York City. It was the first Amer. newspaper to make a feature of shipping, religious, and financial news. It sent H. M. Stanley to Africa in 1869. Under Bennett's son and heir it achieved wide circulation and fame and estab. an ed. issued daily in Paris. The paper was purchased by Frank A. Munsey in 1920, and merged with the *Sun*, under the title *New York Herald*. In 1924 the *Herald* was purchased by the *New York Tribune* and merged with that paper under the title of *New York Herald Tribune* (q.v.).

'**New York Herald Tribune.**' The *New York Tribune* was founded in New York City in 1841 by Horace Greeley, who remained its chief proprietor until 1872, when it was taken over by Whitelaw Reid as editor-in-chief and owner. Reid had served the paper as its chief correspondent during the Civil war. Under Reid the paper became the most stalwart Republican jour. of the E. With the development of Amer. newspapers, the *Tribune* was in the van with its huge Sunday ed. Reid's son, Ogden Reid, succeeded him in control of the paper. In 1924 he purchased the *New York Herald* and merged under the name *New York Herald Tribune*. This paper is the most widely read Republican jour. in the country, and combines a progressive international with a conservative domestic outlook.

'**New York Journal,**' founded in 1882 as the *Morning Journal*. It had a chequered career until 1895 when it was bought by Win Randolph Hearst, who immediately deprived most of the other New York papers of their best brains by paying higher salaries. Hearst made of it a more or less sensational newspaper, which achieved a huge circulation and gave rise to the phrase 'yellow journalism.' It was largely due to the campaign of the *Journal* and other Hearst papers that the people of the U.S.A. were aroused to the point of forcing their gov. to make war on Spain in 1898.

**New York State,** most influential of the U.S.A., called the 'Empire State,' one of the original 13 states, is 3 times the size of England. It is bounded NW. by Lake Ontario, N. by the prov. of Quebec, E. by Vermont, Massachusetts, and Connecticut, S. by New Jersey and Pennsylvania, SE. by Long Is. Sound and the Atlantic Ocean, and W. by Lake Erie. Land area 49,576 sq. m. The beautifully wooded Adirondack Mts are in the N., the Catskills in the E., Shawangunk Range in the S. Lake Seneca and Lake Cayuga are the largest of the Finger Lakes, a belt of lakes in W. New York, and both are about 40 m. in length. Lake Geneva is one of the prettiest. The beautiful George and Champlain lakes lie E. of the state. The famous Hudson R., with Mohawk trib., flows eastward and southward through this state alone, whilst the Delaware and Susquehanna rivs. drain

the central part. The Erie Canal, opened in 1825, connects the Hudson with the Great Lakes. The largest cities are New York, 7,891,957; Buffalo, 580,132; Rochester, 332,488; Syracuse, 220,583; Yonkers, 157,800; Albany, the cap., 134,995; Utica, 101,530; Schenectady, 91,780; Niagara Falls, 90,872; Binghamton, 80,674. The state sends 43 members to the lower house of Congress at Washington, and it is sometimes called the pivotal state, owing to its influence. Education is compulsory between 7 and 16. Univs. include Columbia, New York Univ., Cornell (Ithaca), Syracuse, Rochester, Buffalo, Colgate (Hamilton), Union (Schenectady), and the U.S. Military Academy at West Point, besides Fordham (New York City), Hamilton College (Clinton), the College of the City of New York (New York City), the Union Theological Seminary (New York City), the General Theological Seminary (New York City), Vassar (Poughkeepsie), Barnard College (New York City) for women, and many law and medical schools. The governor is chosen for 4 years. The Senate, which meets at Albany, is composed of 36 members, elected every 2 years, and the Assembly of 150 members, elected every 2 years, 35 being sent from New York City. There are 62 cos., 5 of which comprise the city of New York. Native vegetation consists mostly of maple, hemlock, birch, beech, white pine, spruce, fir, chestnut, yellow poplar, stunted pine, and scrub oak. The commercial forest land amounts to some 11,000,000 ac. N. Y. S. lies largely in the U.S. hay and dairy belt, with about 17,500,000 ac. of farm and dairy land, of which 6,500,000 are in crops. Despite its large cities N. Y. S. is predominantly rural. It ranks second in the U.S.A. in dairying. Besides the large hay crop, oats, wheat, corn, barley, and rye are raised. N. Y. S. ranks second in apples and grapes, and also produces peaches, pears, cherries, plums, and berries. The chief fruit-producing areas are the Finger Lakes (wine-producing) and Hudson Valley. The state is second only to Vermont in maple sugar and syrup production. Truck farming on Long and Staten Is. is also important. Fish resources, from Long Is. Sound and the Atlantic, include shad, cod, flounder, bluefish, haddock, weakfish, blackfish, oysters, clams, and lobsters; there are also whitefish, shad, and herring from the Great Lakes. N. Y. S. produces a wide variety of minerals, including petroleum (S.W.), rock salt, clay, gypsum (W.), zinc, natural gas, cement rock, sandstone, slate, granite, and pyrite. It ranks first in talc, abrasive garnets, emery, wollastonite, and ilmenite. N. Y. S. has been the leading manufacturing state since 1840. Clothing manuf. is the largest industry, followed by printing and publishing, food processing, and the manuf. of machinery, rugs, carpets, textiles, transportation equipment, furniture, refined petroleum, scientific and precision instruments, electrical equipment, tobacco products, chemicals, paper, and

leather goods. Almost two-thirds of the manufacturing output is concentrated in the New York City area, centring in the port of New York, which handles 25 per cent of U.S. domestic trade and 50 per cent of its foreign commerce.

**New York State Barge Canal,** see CANAL.

**New York 'Sun'** was founded in New York City in 1833 by Benjamin Day, who wrote, ed., and printed the paper by himself. In 1868 it passed into the hands of Charles A. Dana, a brilliant, sarcastic, often sardonic editorial writer, who forced upon his staff a style of such high level that the *Sun* was for years the Amer. newspaper man's bible. Dana maintained his own domestic and foreign news service, desiring to have accounts that were different from the highly standardised ones then sent out by news-gathering associations. He was succeeded by Wm M. Laffan, who kept up the paper's high standard until his death in 1909. Frank A. Munsey bought the *Sun* and the *Evening Sun* in 1916, merging the morning ed. with the *New York Herald* in 1920, but continuing the evening paper under the shorter name, *Sun*. The *Sun* ceased pub. in Jan. 1950, and was amalgamated with the *World-Telegram*.

**'New York Times'** was founded in New York City by H. J. Raymond in 1851. The paper had a chequered existence, and was moribund when Adolph S. Ochs, who had made a success with the *Chattanooga Times*, bought it in 1896. Ochs had the ideal of a conservative paper which would never indulge in yellow journalism, and adhered strictly to that programme. To-day the *N. Y. T.* has its own special correspondents in all the great cities of the world. When Ochs became firmly seated in the saddle, to distinguish his paper from the yellow journals, he adopted the motto which is still printed on the first page, 'All the News That's Fit to Print.' The *N. Y. T.* not only prints it, but does so in *extenso*. Its Sunday issue is enormous, averaging about 400 pages. In politics it is Democratic, but independent. See E. Davis, *History of the 'New York Times'*, 1921.

**New York 'World'** was founded in New York City in 1860 and taken over by Manton Marble, who ed. it until 1883, when it was purchased by Joseph Pulitzer, who had made a success with a newspaper in St. Louis. Pulitzer 'shook up the journalistic dry bones' of the metropolis by the methods of the new journalism and 'stunts.' The paper soon achieved wide circulation. But there was a firmer foundation to its appeal to the public in that Pulitzer made of the jour. a great liberal newspaper right in the heart of conservative New York. In 1931 it was amalgamated with the *New York Telegram*, and became the *World-Telegram*. On 4 Jan. 1950 the *World-Telegram* absorbed the *Sun* and became the *World-Telegram and Sun*.

**'New Yorker,'** literary and satirical U.S. weekly magazine, first issued in Feb. 1925. Its chief owner was Harold Ross, who also ed. it. It is pub. by the New Yorker Magazine Inc., whose offices are

at 25 W. 43rd Street, New York 18. It estab. a type of pictorial joke, in which written explanation was reduced to a minimum and attention directed on the joke even at the cost of visual accuracy. This style has had great influence on comic art in America and Europe. The *N. Y.* has, from its first issue, maintained a frankly optimistic and boisterous outlook. It is the nearest Amer. counterpart to *Punch*, but possibly has a less national appeal, being particularly styled to suit the inhab. of New York City. It also contains rather more technical articles than are found in *Punch*.

**New Zealand.** The dominion of N. Z. consists of 2 large and sev. small is. in the S. Pacific. The is. forming the dominion proper for general practical purposes are the N. Is., the S. Is., and Stewart Is., each with its adjacent islets, and the Chatham Is. Outlying is. included within the boundaries as proclaimed in 1847 are Three Kings Is., Auckland Is., Campbell Is., Antipodes Is., Snares Is., Bounty Is., and Solander Is. Is. annexed to N. Z. are the Kermadec Is. (annexed in 1887), Cook Is. and other Pacific Is. (all annexed in 1901). The Pacific Is. consist of Niue or Savage Is., the S. Cook group (Rarotonga, Mangaia, Atiu, Mitiaro, Aitutaki, Mauke, Takutea, Manuae), and the N. Cook group (Palmerston Is., Penrhyn or Tongareva Is., Manahiki Is., Rakahanga Is., Pukapuka or Danger Is., Nassau and Suvarrow Is.). The proclamation of Brit. sovereignty over N. Z., dated 30 Jan. 1840, gave the boundaries of what then constituted the colony, but these were changed by letters patent in 1842, by the Imperial Act of 1863, and again by proclamation in 1901. The boundaries extend approximately from 33° to 53° of S. lat. and from 162° E. long. to 173° W. long. The N. Z. Gov. also administers W. Samoa, at first under a League of Nations mandate and latterly under a trusteeship agreement of the U.N.; and, jointly with the U.K. Gov. and the gov. of Australia, holds the trusteeship over Nauru Is. In 1923 the coasts of the Ross Sea, with adjacent is. and ters., were declared a Brit. settlement under the British Settlements Act, 1887, and named the Ross Dependency. In 1925 the Union or Tokelau Is. were excluded from the Gilbert and Ellice Is. colony and put under the administration of the governor-general of N. Z., and later delegated to the administrator of W. Samoa. The total area of N. Z. (excluding mandated ter., Ross Dependency, and Tokelau Is.) is 103,723 sq. m.; N. Is. and islets 44,281 sq. m.; S. Is. and islets 58,093 sq. m.; Stewart Is. and islets 670 sq. m.; the Chatham Is. 372 sq. m. (total, dominion proper, 103,416 sq. m.); 'outlying' is. 307 sq. m.

**Coast.** The coastline of N. Z. is very long in proportion to its area. Since nearly the whole of the N. Z. land mass lies parallel to the direction of its mt ranges it is not greatly indented and there are few natural harbours. Even where natural harbours do exist, like those on the E. coast of the N. Auckland Peninsula, they are often of little economic consequence owing to their unfavourable situa-

tion. The only 2 safe natural harbours of the N. Is. of which the fullest commercial use can be made are Auckland and Wellington. The prin. straits are Cook Strait, Foveaux Strait, Coromandel Channel, and French Pass. The Is. of Kapiti is in Cook Strait, and Ruapehu Is. in Foveaux Strait, whilst there are sev. is. and islets off the coasts of the main is.

**Mountains.** The mountainous character of N. Z. is one of its most striking physical features. In the N. Is. mts occupy about one-tenth of the surface, but with the exception of the 4 volcanic peaks of Egmont (8260 ft), Ruapehu (9175 ft), Ngauruhoe (7515 ft), and Tongariro (6458 ft) they do not exceed 6000 ft in altitude. Of these 4 the first-named is regarded as extinct, and other volcanoes include Mt Tarawera and White Is., both of which have in recent times erupted, with disastrous consequences. Closely connected with the volcanic system are the multitudinous hot springs and geysers. The S. Is. contains much more mountainous country than is to be found in the N. Along almost the entire length runs the great chain known as the S. Alps, rising to its culmination in Mt Cook (12,349 ft), and no fewer than 17 peaks of this range are over 10,000 ft high. Owing to the snowline being low in N. Z., many large and beautiful glaciers exist, the Tasman Glacier (S. Alps), over 18 m. long and 1½ m. wide, being the largest. In the N. Is. the 2 prin. ranges are the Ruahine Range and the Tararua Mts. To the W. and N. of the Ruahine Range are the Kaimanawa and other ranges. The volcanoes of Tongariro and Ruapehu are to the S. of Lake Taupo; the most noteworthy peak in the N. Is., Mt Egmont, stands in the centre of a promontory on the SW. coast and is conical in shape. The S. Alps are crossed at intervals by low passes, and their highest summits are covered with perpetual snow, and have immense glaciers in their higher valleys. Between Mt Franklin and the W. coast are the Paparoa Mts, and between these and the E. coast are the Kalkoura Mts (highest peaks Tapuaeunuku, 9465 ft, and Alarm, 9400 ft, with 9 others over 7700 ft). The chief peaks of the S. Alps besides Mt Cook are Tasman (11,475), Dampier (11,287), Silberhorn (10,757), Lendenfeldt (10,450), David's Dome (10,443), Malte Brun (10,421), Torres (10,376), Teichelmann (10,370), Sefton (10,354), Haast (10,294), Elie de Beaumont (10,200), Douglas Peak (10,107), La Pérouse (10,101), Haidinger (10,059), De la Bèche (10,058), The Minarets (10,058), Aspiring (9975), Hamilton (9915), Glacier Peak (9865), Aiguilles Rouges (9731), Nazomi (9716), Darwin (9715), Chudleigh (9686), Annan (9667), Lowe (9653), Haeckel (9649), Le Receveur (9562), Goldsmith (9532), Big Mac (9511), Conway Peak (9510), Bristol Top (9508), Walter (9507), Grey (9490), Green (9307), Hutton (9297), D'Archiac (9279), Bell (9276), Hochstetter Dome (9258), Earnslaw (9250), Nathan (9200), Barnicoat (9183), Silbald (9181), Arrowsmith (9171), Spencer (9167), The Footstool (9073), Rudolf

(9039), and The Dwarf (9025). There are also at least 90 other named peaks all over 8000 ft, and 50 over 7500 ft. Although N. Z. is mountainous it has extensive plains, lying mostly on the W. side of the N. Is. and on the E. side of the S. Is. The general character of N. Z. scenery is similar to that of the Brit. Is., although the latter have nothing like its mts, lakes, hot springs, geysers, etc.

*Rivers.* N. Z. abounds in rivs., most of which are, however, shallow and rapid. Owing to the steep grades of their channels, few are suitable for navigation,

strip of coastal plain and cut their channels through old glacial drifts which at one time furnished rich leads of alluvial gold. Chief rivs. flowing from the central portion of the S. Alps to the Tasman Sea are the Taramakau, Arahura, Hokitika, Wanganui, Wataroa, Waiho, Karangarua, Haast, and Arawata. All these rise in glaciers and their valleys are noted for their magnificently diversified bush and mt scenery. The general features of the rivs. which flow into the W.-coast sounds are somewhat similar except that few rise in glaciers, and the rivs. on the E.



*New Zealand Government*

PEMBROKE ROAD, WAKATIPU, SOUTH ISLAND

except near their mouths, but to compensate for this drawback they furnish ideal sites for power plants; and no country S. of the equator, except Chile and Patagonia, possesses greater stores of energy conveniently placed. The rivs. flowing into the Tasman Sea are the Waikato, Wairoa, Mokau, and Wanganui, and they are useful for modern transport, especially the Waikato. This riv. rises in the snows of Ruapehu, and flows in a northerly course for 20 m. as a mt torrent till it reaches Lake Taupo, on leaving which it plunges over the Huka Falls, formed by a hard ledge of volcanic rock, and then runs first NE. and then NW. till it reaches the sea. The central and S. parts of the Tararua and Rimutaka ranges are drained by the Manawatu, Otaki, and other streams running into Cook Strait by the Hutt R. which flows into Wellington harbour, and by the Ruamahanga and its tribs. Sev. large rivs. rise in the Ruahine Mts and their northerly extensions. In the S. Alpine system, the streams flowing to the W. coast of S. Is. cross the narrow

slope of the Alps present features similar to those on the W. coast in their upper courses, but their valleys are broader and flatter. The largest of these rivs. is the Clutha, its vol. of discharge being greatest of any riv. in the dominion. Portions of the course of the Clutha are navigable, though only to a limited extent; but it is important commercially because it has yielded, by means of dredging operations, large quantities of gold. The Jacobs, Oreti, Mataura, and Taieri rivs. belong to the Southland and Otago dists.; forming the N. boundary of the Otago prov. dist. is the Waitaki, which drains a large area of Alpine country, and includes in its basin Lakes Tekapo, Pukaki, and Ohau; its main affluents are the Tasman and the Godley. The chief rivs. rising in glaciers on the S. Alps are the Rangitata, Ashburton, Rakai, and Waimakariri, and further N. are the Hurunui and Waiau.

*Lakes.* The N. Z. lakes are usually attributable to the filling up of hollows formed by faulting or warping, or by

volcanic explosions, or by the irregular accumulation of material round volcanic vents, or to the interference with riv. valleys by glaciers; and, since all these agencies have operated on an extensive scale in N. Z. in comparatively recent geological times, it is not surprising that its lake systems are well developed. The striking lakes of the middle of N. Is. are due to volcanic action; those in S. Is. to glacial action. Hence there are 2 distinct types of lake scenery. In the S. Is. the lakes lie amidst splendid mt scenery, their waters 'rendered milky-white at times with the finest of sediment worn from solid rocks by powerful glaciers, and swept down to the quiet waters of the lake by turbulent glacial torrents.' In the N. Is., the relief of the land near the volcanic lakes being by no means marked, the shores of the lakes are rarely precipitous, and their scenic interest depends on their surrounding subtropical bush and partly on their desolate and forbidding environment. The largest sheet of fresh water in N. Z. is Lake Taupo, in the heart of the N. Is., at an elevation of 1211 ft above the sea (area 238 sq. m., greatest length 25 m., greatest breadth 17 m., maximum depth 534 ft). Near the middle of the lake lies the Is. of Motutako, probably the summit of a volcanic cone. The lake forms an enormous reservoir of power conveniently located for exploitation. An interesting group of lakes lies in the midst of the thermal region to the NE. of Lake Taupo. These comprise Rotorua, Roto-titi, Roto-ehu, and Rotoma. The largest lake of the SE. group is Tarawera, N. and W. of Mt Tarawera; others are Rotokakahi, Okaroku, and Okataina, all owing their interest to the thermal action which occurs near them, and to their fishing, for they are especially well stocked with trout. Some 40 m. from the E. coast, in Hawke's Bay dist., is Waikare Moana (21 sq. m. in area), lying 2015 ft above sea level, and having a maximum depth of 846 ft. Along the coastline are many small lakes, such as Rotokawa and Horowhenua; and a large shallow expanse of water occurs near the mouth of the Wairarapa valley, called Lake Wairarapa.

In the S. Is., in the Grey R. valley, are 2 fair-sized lakes, Brunner, 15 sq. m., and Poerua—the former bounded on 2 sides by high wooded granite peaks. A beautiful sheet of water is Lake Kanieri (8 sq. m.) in the basin of Hokitika R., near Mt Tuhua. On the E. side of the main divide lie the great valley lakes belonging to the riv. basins. These include Lakes Sumner, Coleridge, Heron, Tekapo, Pukaki, Ohau, Wanaka, Hawea, Wakatipu, Te Anau, Manapouri, Monowai, Hauroko, and Poteriteri.

Before the eruption of Mt Tarawera in 1886, the Rotomahana Lake was widely celebrated for its pink and white terraces and boiling springs, which were then destroyed. The hot springs of the N. Is. form one of the most remarkable features of N. Z. They are found over a large area, stretching from Tongariro, S. of Lake Taupo, to Ohaeawai (a distance

of 300 m.); but the prin. seat of hydro-thermal action appears to be in the vicinity of Lake Rotorua, 40 m. NNE. from Lake Taupo. In spite of the destruction which was wrought in 1886, the natural features of the country, lakes, geysers, and hot springs (which last-named possess remarkable curative properties in certain complaints), are still very attractive to tourists and invalids. The importance of conserving the famous region as a sanatorium for all time has been recognised by the gov. and it is dedicated by a statute to that purpose.

*Geological formation.* The geological hist. of N. Z. is as complex and as ancient as that of a continent. Lava probably persisted in the N. Z. area from the oldest Palaeozoic age, or even earlier. The 2 important geological periods for N. Z. are those that followed the 2 latest mt-building movements, the Kaikoura deformation of the late Tertiary time, and the Hokonui deformation of the early Cretaceous. The deposits of the intervening period of relative crustal stability cover a large part of the land, and contain all the coal and most of the limestone of the country. The soils on which grow the forests, pastures, and crops are of post-Tertiary age, and the great bulk of the gold has been won from deposits formed during the same period.

*Seismology.* Earthquakes are, unfortunately, somewhat frequent in N. Z., that of 1931 being especially severe. The earthquakes of the Auckland Peninsula, a seismically sensitive dist., may be locally severe, but are not usually felt far from their point of origin. The tectonic earthquakes along the main earth-fold, however, shake large areas; but, fortunately for N. Z., the most severe earthquakes originate along the great shears that cut the submerged flank of the main fold 200 m. E. of the N. Is. Many great faults and fault zones have been traced by seismologists for long distances, but a few only have been active since European occupation. Recent levellings indicate that the earth block towards the E. is sinking somewhat irregularly, a movement causing some of the innumerable local aftershocks still being felt in that area. Other sensible earth movements occurred in connection with the Taupo earthquake of 1922, the Amuri earthquake of 1888, the Wellington earthquake of 1855, and probably the Awatere earthquake of 1848. In 1929 the NW. part of S. Is. was visited by a severe earthquake which was felt over the whole dominion, but only 17 lives were lost, as against over 200 in the much more severe earthquake which occurred in Feb. 1931 in N. Is., with disastrous results to the tns. of Napier and Hastings in the prov. dist. of Hawke's Bay (in Napier about 145 persons lost their lives).

*Climate.* The climate of N. Z. is temperate and healthy, and similar to that of Great Britain, save that it is warmer and more equable. More rain falls on the W. than on the E. coast, and the climate is more equable on the former. Naturally considerable variations are met with in

different parts of a country which extends for over 1000 m. from N. to S.; the extreme N. of N. Is. is subtropical in character, whilst severe frosts and deep snow on the uplands are common in winter in the S. Is.

**Flora and fauna.** The only pre-European mammals were the Maori rat and the now extinct dog, but there were also native bats. The native plants are numerous and include many peculiar species. There are about 120 indigenous forest trees, all of them evergreen; the kauri pine, sev. kinds of cedar, red and white birches, and the iron-wood tree may be mentioned. A great variety of ferns is found, and large tracts are covered with nutritious indigenous grasses which support over 32,000,000 sheep. The N. Z. flax (*Phormium tenax*) is a plant of considerable importance, being much used in rope-making. With few exceptions the most beautiful flowers of N. Z. belong to the high-mt flora. There are giant buttercups, white and yellow (but nearly all the flowers are of these colours), and they are to be seen by the acre; there are also lovely ourisias, with the flowers in whorls round the stem, as in some of the Asiatic primulas; forget-me-nots, yellow, bronze, purple, or white; the snow-groundsel, with marguerite-like flowers; and edelweiss, far surpassing the Swiss. But the chief plant of the mts is the *Celmisia*, whose leaves cover subalpine slopes with a mantle of white. Birds are numerous, and also include many species peculiar to the country, such as sev. flightless and weak-winged types. These include the kiwi (see *APTERYX*), kakapo or ground parrot (*Strigops*), takahe (*Notornis mantelli*), and the extinct moa and *Aptornis*. There are also the parrots kea and kaka.

Fresh-water fish, with the exception of eels, are not plentiful, though many lakes and rivs. are well stocked with trout; but many varieties of edible fish are found on the shores, and excellent oysters. Sharks are common, but rarely attack man, and penguins are found on the islets of the far S. and elsewhere. Amongst sea mammals whales are the most important, and at one time extensive whaling was carried on, but the industry has declined greatly since 1840. There are no reptiles beyond various species of lizards and frogs. The only poisonous land animal is the *katipo*, a beach spider.

With the advent of Europeans the whole face of the fauna of N. Z. was changed. Capt. Cook introduced the first pig in Queen Charlotte Sound in 1773. With settlement sheep, cattle, and horses, and other domestic animals, were brought; also song-birds, and animals, birds, and fish for sport, such as deer, trout, pheasants, and quail. But the introduction of rabbits, stoats, and weasels was an irretrievable blunder, owing to the damage wrought by these animals to vegetation and bird life.

**Railways.** Construction on the first railway in N. Z. was begun in 1860 and the first part opened in 1863. The line ran from Christchurch to Lyttelton. All railways in N. Z. are now state-owned save

some 180 m. and private lines to factories, etc. In 1945 there were 3504 m. of railway, 1684 being on the N. Is. and 1820 on the S. Is. In 1955 the total revenue received from railway and ancillary road services was £31,285,000; expenditure was £29,417,000. In recent years there has been a great development of Diesel electric trains and rail cars.



English Electric Company

#### HYDRO-ELECTRIC POWER

Piriapua power station of the Waikaremoana scheme, containing two 28,000-h.p. water turbines. The operation of this station is completely automatic.

**Shipping.** Regular and frequent steam traffic exists between all the prin. ports of N. and S. Is., and communication is maintained with Australia, England, and America. The prin. lines are the N. Z. Shipping Co.; the Union Steamship Co.; the Oceanic Steamship Co.; Shaw Savill and Albion Co.; Blue Star Line; and Port Line. The prin. ports of the country are Auckland and Wellington in the N. Is., and Lyttelton and Port Chalmers in the S. Overseas shipping showed a marked increase after the Second World War. The total of ships entering in 1955 was 2200, being more than 3 times the average for 1938-9, which was 635. Net tonnage in 1955 was 9,184,000. About four-fifths of the ships entering were British.

**Airways.** Complete control of air transport as a national service was estab. by an Act of 1945. All internal airways are operated by the N. Z. Airways Corporation which was set up by the Act. Tasman Empire Airways Ltd., a N. Z. company, operates services to Australia and Fiji. Passenger miles flown by internal scheduled services in 1955 were



93,890,000, and miles flown 6,195,000. On external services (by T.E.A.L.) 4,237,000 m. were flown and 51,000 passengers carried.

**Fisheries.** With its great length of coastline N. Z. has always been famed for the productivity of its fisheries. Off its more northerly coasts subtropical fish are found and off the S. coasts are found cold-water fish and the fur-bearing seal. The most important edible fish are the schapper, the tarakihi, mainly taken by trawlers in the waters of the Hauraki Gulf, Bay of Plenty, Hawke's Bay, etc., and a variety of flounders, blue cod, and the groper. The fishing industry is controlled by the marine dept and all engaged therein commercially must hold a licence. The most important fishing ports are Auckland, Wellington, Thames, Timaru, Napier, Port Chalmers, Lyttelton, and The Bluff. There are extensive oyster beds in Foveaux Strait and on the E. and W. coasts of Auckland. Crayfish occur in abundance and also N. Z. whitebait. There is a small whaling industry, and seals are taken under strict gov. supervision.

**Minerals and mining.** The gold-mining industry has declined in importance since the early stages, when it contributed so largely to the progress and settlement of N. Z. The chief minerals are gold and silver, platinum, osmiridium, tungsten ore, iron, silica sand, stone, pumice, sulphur, and coal. The value of gold mined in 1953 was £488,703 (38,656 oz.); silver, £23,292 (75,888 oz.); coal, £6,419,000; tungsten ore, £40,091; limestone for agriculture, £1,121,013; and silica sand, £73,451. Other minerals include copper, manganese ore, cinnabar, tin (cassiterite in the form of 'stream-tin' occurs near Port Pegasus), petroleum (drilling has been carried out in recent years in Taranaki, Hawke's Bay, and Canterbury), kauri gum, phosphate rock, greenstone. N. Z. has a great variety of handsome and durable building stones. Valuable non-brickmaking clays are found. Uranium deposits have been discovered in the Buller Gorge.

**Agriculture.** N. Z. is primarily an agric. country: much of the soil is rich, varied, and fertile, the climate mild and equable, and the countryside well watered. While it is mainly a grazing country noted for its dairy cattle and sheep, crops of wheat, oats, and roots are extensively grown. Two-thirds of the surface of N. Z. is suitable for agriculture and grazing and the total area under cultivation in 1946 was nearly 20,000,000 ac. The chief crops grown are wheat (73,000 ac. in 1955-6, 123,751 ac. in 1948), oats (36,000 ac.), and barley (44,000 ac.). In various parts of the N. Is. fruit-growing, especially apples, pears, and peaches, is carried on extensively. Citrus fruits are produced, and lemons in particular are cultivated on a considerable scale. There is an export trade in apples and pears.

**Forestry.** All state forests and related afforestation activities are controlled by the State Forest Service headed by the director of forestry. In Mar. 1946 the

area of state forests was 9,189,763 ac., representing 13.8 per cent of the total area. The policy is one of conservation and expansion, particularly with a view to combating soil erosion. The prin. softwoods include white pine, mt cedar, kauri (the largest and most celebrated tree of N. Z.), black pine, miro (used in house-building), silver pine, tanekaha, and totara; hardwoods, black, hard, red, and silver beech, black-maire, hinu, kamahi, kokehoe (sometimes called cedar), manuka, or tea-tree, pukatea, N. and S. rata, rewarewa, and tawa. The prin. timbers milled in N. Z. are rimu and kahikatea. The value of forest products in 1953-4 was £17.2 million.

**Commerce.** The chief industries of N. Z. are the meat freezing and preserving industry and the butter, cheese, processed milk, and allied industries, and the new newsprint industry (see KAWHAU and KINLEITH). Next to these come the saw-milling, paper and printing, engineering, and textile industries. The prin. exports are wool, butter, cheese, frozen meat, hides, skins, and gold. About 80 per cent of exports go to Brit. countries, and the U.K. supplies about 50 per cent of imports. The prin. exports in the calendar year 1955 were: wool, £93,780,000; dairy produce, £70,051,000; meat, £68,194,000. Total exports were £258,850,000. Imports in 1954 totalled £245,820,000 c.i.f. (Cost, Insurance, and Freight), value: machinery and transport equipment, £61,489,000; textiles, clothing, and footwear, £35,372,000; food, beverages, and tobacco, £24,829,000; mineral fuels, £14,964,000; chemicals, including manuf. fertilisers, £13,327,000; base metals and manufs. of metal, £27,135,000.

In 1936 the gov. introduced a guaranteed price system for dairy produce, to ensure stability of income for producers, and undertook the marketing of the purchased produce. During the Second World War this system was extended to all farm produce in effect, by the system of bulk purchase agreement entered into with Britain, and the arrangement continued until 1955 except for wool (1949). The vol. of production of secondary industries, that is, those not connected with processing primary products, increased by 47 per cent between 1938-9 and 1946-7, and the numbers employed increased by 30 per cent. In the main, expansion has been in the development in new branches of existing industries such as engineering, textiles, and clothing. N. Z., however, lacks supplies of some vital industrial raw materials, e.g. iron, and there is a shortage of power supply, despite the many hydro-electric schemes.

State participation in economic activities has long been a familiar feature in N. Z., and increased during the term of office of the Labour Gov. (1935-49). It takes the form of direct state action, as in railways, tourist services, and broadcasting, and also of controls designed to ensure state direction of the country's economy, whilst leaving its administration to private enterprise.

**Population.** The pop. of N. Z. is

divided into the Maori and European pop., the Maoris being the native inhab., though another people had preceded them (*see* MAORIS). The Maoris are the finest in physique and the highest in intelligence of all the Polynesian peoples. Their language is a Polynesian dialect differing but slightly from the Hawaiian and other similar languages. The European pop. has shown an unbroken increase over the past 100 years, and the early preponderance of men over women has now been eliminated, the proportions being about equal. Immigration, which supplied the greatest source of pop. increase in the past, has gradually slowed down; in 1931-5

Rom. Catholic, 13.6 per cent; and Methodist, 8.1 per cent. There are small numbers of representatives of other Christian denominations and a few Hindus, Confucians, and Jews. Education is free, secular, and compulsory. The central administration of education is vested in a minister of education, and the local control is in the hands of 9 education boards, and of school committees. There are nearly 2000 public primary schools (314,561 scholars on the rolls in 1954). Secondary education is provided at 47 secondary schools, 100 dist. high schools, 28 technical high schools, and technical day schools. There are 9 secondary schools for Maoris besides many native schools and Maori mission schools. For higher education, there are 4 endowed colleges affiliated to the univ. of N. Z., and each specialises in one or more directions. At Dunedin, the special subjects are mining, medicine, dentistry; at Christchurch, engineering and chemical engineering; at Wellington, law and science; and at Auckland, commerce, engineering, architecture, and medicine. There are agric. colleges at Lincoln, Canterbury, and at Palmerston N. (Massey College), and there are 7 schools of mines besides the Otago Univ. School of Mines.

*Social conditions.* There is extensive legislation governing hours and conditions of work and basic wages in all sections of industry and agriculture. An 8-hour day is in force and disputes are settled under an Arbitration Act. A Social Security Act, passed in 1938, became operative on 1 April 1939. The prin. objects of this legislation are (i) to substitute for the system of non-contributory civil pensions, e.g. old age, widows' and other pensions, a system of monetary benefits on a contributory basis; (ii) the inauguration of a system of medical and hospital benefits, and of other related benefits. Mention may here be made of the work of Sir Frederick Truby King (1858-1938), a N. Z. physician b. at Wellington. He founded, in 1907, the Plunket Society for the health of women and children, and from 1921 to 1927 was director of child welfare in N. Z., achieving most beneficial results in the lowering of the child mortality rate.

*Defence.* A council of defence, consisting of 5 Cabinet ministers, the chiefs of staff of the services, and the secretary of the Treasury, deals with defence policy and organisation; it acts only in an advisory capacity and responsibility for decisions rests with the Cabinet. The minister of defence is the president of each of the 3 service boards which are concerned with training and administration. The N. Z. Army is a small regular force supplemented by the territorials. The decision to adopt compulsory military service (reversed in 1958) entailed a considerable increase in the total personnel. The navy includes the cruisers *Royalist* and *Black Prince*, 6 frigates, 2 corvettes, 10 trawlers, a survey vessel, and 4 coastal craft. The gross intake of men into the armed forces between 1939 and 1945 was estimated at 224,000, of whom



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there was a net exodus; in 1948 arrivals were 33,144, and departures 27,388.

The 1956 census gave the pop. of N. Z. as 2,172,350, inclusive of 135,015 Maoris. N. Is. pop. was 1,496,155, and S. Is. 676,195. The chief towns with pops. including Maoris were Wellington, 138,035; Lower Hutt, 47,756; Auckland, 380,412; Christchurch, 193,183; Dunedin, 99,326; Invercargill, 34,293; Palmerston N., 37,751; Hamilton, 40,600; Wanganui, 32,106; New Plymouth, 28,282; Hastings, 27,773; Napier, 27,492; Timaru, 34,700; Gisborne, 22,607; Nelson, 22,509.

In the 1956 budget the finance minister, J. T. Watts, budgeted for a Consolidated Fund surplus of £3.7 million from revenue totalling £204,100,000. Social security fund revenue for the year to 31 Mar. 1956 was £74,111,000, and expenditure £72,883,000.

*Religion and education.* There is no state Church, and no state aid is given to any form of religion. The main religious denominations in order of strength (1951) were as follows: Church of England, 37.8 per cent; Presbyterian, 24.3 per cent;

160,000 joined the army, 12,000 the navy, and 52,000 the air force. In addition, 10,000 women served in the forces. Total deaths in the services and mercantile marine were 11,625.

**Constitution and government.** The country was at first a dependency of New S. Wales, but was separated by letters patent in 1842. Its settlement was effected largely by the N. Z. Co., with a royal charter, which was surrendered in 1850. By an imperial statute of 1847 N. Z. was divided into 6 provs., later 9, Auckland, Taranaki, Wellington, Nelson, Canterbury, Otago, Hawke's Bay, Westland, and Marlborough, each governed by a superintendent and elected prov. council. In 1876 the prov. system of gov. was abolished, the powers previously exercised by superintendents and prov. officers passing to the governor or local boards, and the country was divided into cos. and bors. An Act granting representative institutions to N. Z. was passed by the Imperial Parliament on 30 June 1852. Under that Act the constitution of a General Assembly was provided for, to consist of a Legislative Council and a House of Representatives. The first session of the General Assembly was opened in May 1854, but the members of the executive were not responsible to Parliament. The first ministers under a system of responsible gov. were appointed in 1856. In 1907 the style and designation of the colony of N. Z. was altered to 'The Dominion of New Zealand.' By letters patent, 11 May 1917, the designation of governor was altered to 'Governor-General.' The legislative council was abolished in 1950. Members of Parliament receive a salary of £1100 a year. The members of the House of Representatives are chosen by electors possessing a liberal franchise: registration of electors on the roll is compulsory. Every elector, male or female, is qualified to become a member (women being given the right to be elected to either House in 1919). Every adult Maori in any of the 4 Maori electoral dists. can vote, provided he or she be not registered on any European roll. The House of Representatives now consists of 80, including 4 Maoris elected by the Maoris themselves. Control of native affairs, and the entire responsibility of dealing with questions of native gov., were transferred in 1863 from the Brit. to the N. Z. Gov. In 1885 the seat of gov. was removed from Auckland to Wellington on account of the central position of the latter city. Justice is administered by 10 supreme court judges besides 3 judges in special courts. The police force is a national body maintained wholly by the central gov. The death penalty, except for treason, was abolished by the Crime Amendment Act, 1941, but restored in 1949.

**History.** The hist. of the is. of N. Z. can be traced back some cents. through the traditions and genealogies of the Maori tribes whom Cook found in occupation, but Britain's influence on the country's destiny began only with the voyages of the great navigator in quest

of the S. Continent (see *TERRA AUSTRALIS INCOGNITA*). Tasman sighted the S. Alps in 1642 but he made no landing. Cook's first voyage off the coast was in 1769-70. Within a brief space of his return in 1771 a plan for the colonisation of the country was put before the Brit. public by Benjamin Franklin and the hydrographer Alexander Dalrymple (qq.v.), but colonisation began only after the loss of the Amer. states had brought the penal settlement of New S. Wales in contact with N. Z. Maori visitors to New S. Wales prompted the sympathetic interest of the colonial chaplain, Samuel Marsden, whose first mission was postponed by the massacre of the crew of the *Boyd* so that it was not till Christmas 1814 that Marsden



*High Commissioner for New Zealand*

THE TREATY HOUSE AT WAITANGI, BAY OF ISLANDS

The treaty of 1840 was signed here.

preached the first sermon in N. Z. Hongi, the Bay of Is. chief, exploited the missionaries in order to acquire arms for his wars against other tribes. Marsden's intervention, supported by the energy of the Rev. Henry Williams, however, thwarted Hongi's efforts to win a dominating position, and with his death (1828) the bane of intertribal wars was ended. But with no source of tribal authority or guidance, contact with European civilisation threatened the Maoris with political and economic collapse, and in 1830 Marsden suggested to the governor of New S. Wales the desirability of appointing a Brit. representative in N. Z., backed by naval visits in order to control a growing community which was incapable of adjusting itself to change without such control. The immediate result of this suggestion was that the Brit. Gov. sent a resident, James Busby, to the Bay of Is., to be subordinate to the gov. of New S. Wales, but Busby's attempt in 1835 to form a confederation of the united tribes of N. Z. proved abortive. The one man whose influence in N. Z. was profound and enduring was the celebrated Edward Gibbon Wakefield, whose efforts,

despite official and missionary antagonism, to inaugurate systematic colonisation marked, in effect, the dawn of a new era in overseas settlement. Enlisting the support of politicians, religious leaders, business men, and others, he eventually succeeded in his purpose of making N. Z. a Brit. colony in the full sense of the term. It is said that the home gov.'s hand was forced by indications of Fr. missionary infiltration and whaling expeditions in the seas off N. Z., factors which had indeed intensified Wakefield's efforts, for without even troubling himself over official sanction, his N. Z. Co. sent out its prin. agent, Col. Wm Wakefield, in May 1839 in anticipation of the arrival of settlers. In that year the gov. sent out Capt. Hobson, a naval officer, to negotiate with the Maori chiefs for the recognition of Brit. sovereignty, and the result was the treaty of Waitangi (6 Feb. 1840), the charter of Maori rights and a treaty which has had the greatest influence in winning that confidence in the Brit. Crown which has so greatly conduced to the harmonious relations subsisting between 'Pakeha' (white man) and Maori to-day, though in the intervening period there were wars and occasional violations of the treaty.

Hobson was, in effect, the first Brit. governor of N. Z., and under him Brit. law and gov. were estab. in the N., where the Maoris were most numerous and where the H.Q. of the N. settlement were moved from the Bay of Is. into Auckland, which in 1841 became the seat of gov. It was, none the less, the organised colonisation of the N. Z. Co. which ultimately had the most influence on the character and the plan of the new colony. Under the company's aegis was founded Wellington, while new colonies were estab. all round the coast by bodies of settlers who gave to them the names of their places of origin, e.g. Dunedin in Otago harbour, founded by the Free Church of Scotland in 1848, and Christchurch, founded by the Canterbury Association in 1850. The later settlements, profiting by their predecessors' errors, devoted themselves to pastoral activities from the outset and thereby founded N. Z.'s first staple industry. Land settlement, generally, did not expand as the company had hoped, and for many years settlers preferred to work in the tns for wages. A still greater error of the company was to ignore the validity or otherwise of the title to land sold to them over the heads of the Maori occupiers. Over this and other matters, such as the imposition of customs duties, discontent flared up into actual warfare in the N. in 1845, but the Brit. Gov. recalled Hobson's vacillating successor, FitzRoy (q.v.), and sent out the famous Sir George Grey (q.v.), governor of S. Australia, who soon compelled the Bay of Is. tribes to sue for peace. This was the period of Lord Durham's celebrated report on Canada, recommending the management of internal Canadian affairs by a Cabinet responsible to the Canadian electorate (*see* DURHAM REPORT), and in relation to N. Z. the Brit. Gov. agreed to the view of the N. Z. Co. that N. Z.

should have representative institutions. An Act to that effect was passed in 1846, though Grey was opposed to its proposed div. of the country into European and Maori dists., it being evident to him that the Maoris would never agree to a gov. in which they had no share. His arguments prevailed with the gov. and the Act was suspended pending a new Act of 1852. Though Grey had thus delayed self-gov. in N. Z. for 6 years it is still open to question whether the colony was really ready for it in 1852. The New Zealand Constitution Act of 1852 was a liberal measure for its time and, subject to subsequent amendments, it is still the basis of the constitution of N. Z. The Act, however, did not go so far as to provide for responsible gov. A motion seeking ministerial responsibility was moved in the local Assembly by Gibbon Wakefield, himself now a colonist, and this being almost unanimously passed, the Brit. Gov. acquiesced (1856). Thus within less than 2 decades of the setting up of Brit. authority in N. Z. (1840) that authority, with but a single important reservation, had been transferred to the colonists so far as their domestic affairs were concerned.

There were 2 Maori wars: the first lasted from 1845 until 1848; the second from 1860 with little intermission until 1870. But fully one-half of the tribes have always been friendly to the English and many of them fought on the side of the colonial gov. against their own countrymen. Permanent tranquillity was estab. in 1871 throughout the country. The real cause of the outbreak of 1860 was that the tribes and their chiefs felt that their traditions and whole way of life were jeopardised by the colonists, who had now so firmly estab. themselves that, in the S. Is., most of the land had been transferred to the Crown for nominal sums, while even in the N., where Maori settlements were much larger, the Crown owned 4,000,000 ac. Moreover the Maoris realised that they had no share or voice in the constitution, whence the Maori King movement or attempt to create a Maori state within the state; but mutual suspicion between Maori and European settler was incompatible with any hope of success for this movement. The operations in Taranaki (q.v.) lasted about a year, ending in Mar. 1861. Colonial volunteers and militia, in addition to imperial troops, had taken part in the campaign. At this juncture Sir George Grey returned to N. Z., having volunteered his good offices; but his efforts to win back the confidence of the tribes were in vain and the hopes of peace receded. The tribes of the Waikato, the heart of the Maori King movement, were preparing to renew the fighting. Brit. troops from Taranaki invaded the Waikato in July 1863. Meanwhile there was a protracted dispute with the Brit. Gov. as to whether the wars were justified and whether the use of imperial troops could be defended, and as to how far the colonial gov. was empowered to make war on its own responsibility. In the

result the colony, recalling Wakefield's advice to do so, relied on its own financial and military resources and the war at length seemed to die away. But in 1868 there was a fresh outbreak in Taranaki under a clever guerrilla leader, Te Kooti. At this moment of danger the home gov., anxious to rid itself of the colony's wars, withdrew the one imperial regiment then in N. Z. (1870), so that this later campaign was fought and won by colonial levies aided by friendly tribesmen. Maori losses were considerably heavier than those of the colonists, which were only a few hundred, and the Maoris had lost much of their belief in their own destiny as a race. Fortunately, however, there have always been tribesmen, such as Te Waharoa the 'king-maker,' who have been shrewd enough to grasp European conceptions of statesmanship and thereby foster the hope, gradually realised, that the long struggle would eventually lead the way to partnership. This process was hastened by a Colonial Act providing for the election of 4 Maori members to the House of Representatives and by the passing of the Native Schools Act.

Meanwhile gold had been discovered in Otago, in the valleys of the W. coast of S. Is. (1861-5), and the inevitable gold rushes spelt much, if irregular, development largely enhanced by the ambitious plans of Julius Vogel, a gold-seeking immigrant who had become colonial treasurer and, in that capacity, introduced his famous public works budget of 1870. Under his schemes 100,000 immigrants were brought into the country; railways were built to open up new lands; new industries, including woollen mills, foundries, and paper mills, were introduced. There was a severe reaction later from this 'Vogel boom,' but under Vogel's successor, Atkinson, financial equilibrium was gradually restored. In the early nineties the public debt of N. Z. was no less than £40,000,000, which in itself affords some indication of confidence in the destiny of the country; for the total amount invested in land and mortgage companies operating in N. Z. was £30,000,000, so that the total Brit. investment in the colony was about £70,000,000. Overmuch reliance on the London money market might, however, have seriously depreciated the country's credit and there was a crisis in 1894, when the N. Z. Gov. came to the aid of the Bank of N. Z. by guaranteeing an issue of new shares up to £2,000,000. It was significant, however, that the credit of the country was sound enough to save its leading bank from failure. The ensuing years saw considerable legislative activity in the sphere of fiscal and social reform; thus the Land and Income Tax Act enabled large estates to be compulsorily acquired for settlement, and during 1894-8 were passed a Factory Act, a Shops and Offices Act, an Act for compulsory arbitration in industrial disputes, and an Old Age Pensions Act, all Liberal measures which represented an important change in the progress of N. Z. towards political maturity, besides

revealing what later became emphasised as a characteristic N. Z. outlook, an outlook which has in recent years seen striking manifestation in an advanced social security scheme (1938). This Liberal programme was indeed the fruit of the distribution of power between the gov., as representing the people, and the strong capitalist class, resulting in the development of the country's resources to the general advantage, and it owed its success partly to the work of John Ballance and still more to the notable premiership of Seddon (q.v.). Seddon was in power to the end of his life and by his state coal-mines, state accident and fire insurance, and the like maintained the attitude characteristic of the earlier Liberal reforms; but he was not prepared to accede to more extreme Socialistic demands from the small farmers. The influence of the small farmers increased with each election, and though Seddon's successor, Ward, had no success with them, Massey (q.v.), leader of the new Reform Gov., who had been a working farmer all his life, enjoyed the confidence of the farming community. The development of N. Z. farming had gathered momentum, and the N. Z. farmers believed themselves to be the real masters of the country. In view of the great exports of wool and of dairy products there was some justification for their attitude. Feeling themselves the political masters they demanded the right to purchase their freeholds on reasonable terms, and Massey conceded this right.

Always loyal to the imperial connection, N. Z. freely supported Great Britain in the Boer War of 1899-1902. At the outset Seddon, with the practically unanimous support of the representatives, offered a N. Z. contingent, and some 7,000 officers and men were sent to S. Africa. Throughout his 13 years of office Seddon, of all dominion statesmen, was the strongest supporter of Joseph Chamberlain's dreams of closer union, and at the Colonial Conference (1902) he suggested that each of the self-governing colonies (as they then were styled) should maintain a body of troops especially for imperial service. At the Imperial Conference of 1911 Ward, who shared Seddon's imperial sentiment, put forward a plan for an imperial council to which the sev. dominions (as they now were styled) should elect members on the basis of their pop. But the proposal came to nothing, Asquith, the Brit. Premier, making it evident that the shaping of foreign policy was the exclusive prov. of the mother country. Ward's purpose, however, was to remedy the position that the dominions could be committed to war by the sole decision of the U.K. Gov. However, in 1909, when Brit. naval supremacy was threatened by Germany's programme of construction, N. Z. offered Britain a battleship. In the same year the N. Z. Gov. adopted the principle of compulsory military training. In the First World War an expeditionary force of 10,000 men sailed for the Middle E. and formed part of the famous Anzac Army. In all 117,000

men volunteered or were called up for foreign service, and 7000 for home service; and of these 92,000 were volunteers, conscription being introduced in 1916. During the later stages of the war there was labour unrest, and the N. Z. Labour party of to-day had its origin in those years. Taxation was greatly increased, but the war was financed by loans. N. Z. began the war with a national debt of £100,000,000; by the end of the financial year 1919 it was £178,000,000, much of the increase being, however, met by borrowing on the local market. The most important effect of the war in N. Z. was a ripening of national self-consciousness, coupled

aimed largely at Brit. shipping companies and middlemen. But although the net result of this legislation was the expansion of the farming industries, the restoration of pre-1914 prosperity seemed as remote as ever. The Coates (q.v.) Gov., formed after Massey's death (1925), was not in favour of further borrowing on London, but in 1928 Ward's Gov. was returned to office on a platform of land settlement and railroad development to be financed by loans, and £30,000,000 was borrowed in the next few years. When, however, in the economic crisis of 1930-2, it appeared that the Brit. market for N. Z. farm produce had shrunk, N. Z.'s economy was



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with a fuller appreciation of the difficulties and responsibilities of Britain. Massey, however, did not favour the Canadian and S. African demands for separate representation at the Peace Conference and separate membership of the League of Nations, and indeed he viewed these manifestations of nationalism with apprehension, yet he was not prepared to give Britain an unqualified support at every turn. Both Massey and Ward took part in the Peace Conference and duly signed the treaties. N. Z. became a member of the League and accepted W. Samoa as mandatory, giving up her previous desire for outright annexation.

After the war the interdependence of Britain's and N. Z.'s economies remained N. Z.'s major preoccupation, for her previous prosperity had declined and the efforts to restore that prosperity form the content of economic and political hist. throughout the next 2 decades. This was, in part, effected in the early twenties by the passing of export control legislation

seriously threatened, though after the Ottawa Economic Conference (q.v.) hopes were entertained that the country's dairy produce exports would recover as the result of the institution of preferential tariffs against foreign produce. By the end of 1933 N. Z. was on the road to recovery, mainly through the expansion of the wool market, but in a world in which guns were of greater importance than butter the dairy industry was still at a low ebb, and in 1934 a Royal Commission, appointed to report on the industry, recommended control coupled with more efficiency. N. Z. economic anxieties were further increased in 1935 when the Brit. Gov. decided to tax imported mutton and lamb for the benefit of the home producer. In this crisis the country, under its first Labour Gov., in which Mr Savage secured 55 members in a House of 80, followed the path of economic nationalism. The Labour Gov.'s first important measure of credit policy was to change the Reserve Bank, estab. in 1934, into a Central Bank

to carry out the monetary policy of the gov. By 1938 N. Z. felt that its prosperity had been restored, for in 1937 her exports yielded nearly £67,000,000, almost as high a total as had ever been achieved. This was accomplished during an era of Socialist administration, when high wages were paid and an ambitious programme of public works set afoot as a system of relief for unemployment, pensions were increased, a big housing programme was begun, and the 44-hr week had been introduced; all this had been accomplished without having solved the problem of dairy produce exports, though agreement with Britain had been reached on the question of marketing of meat. But this newly won prosperity rested on an insecure foundation inasmuch as the country was importing more than it could pay for. The gov. found that it could only discharge its liabilities for interest on loans by a policy of restricted trade and in the result a new loan was arranged. Brit. Gov. credits of £5,000,000 for defence and an export credit of £4,000,000 to finance imports were granted as a result of the mission of Walter Nash (q.v.), the N. Z. finance minister. Throughout this period of repeated economic and financial difficulty, however, the will to co-operate with Britain politically was never wanting in N. Z. Common interests strengthened the community of sentiment and political tradition. Conscious of her interests in the Pacific, N. Z. actively supported the construction of the Singapore base (q.v.) and Massey protested when construction was suspended by the Brit. Labour Gov. of 1924. The N. Z. Gov. contributed £1,000,000 when work was resumed. With the return to office of a Labour Gov. in N. Z. in 1935 there was, for the first time, a pronounced difference of views on foreign policy between Britain and N. Z. This difference concerned 'collective security,' belief in which N. Z. shared with the Labour opposition in Britain as the best policy for the empire in general. For the N. Z. Gov. had a strong faith in the League of Nations and had little sympathy with the Brit. Gov.'s efforts to compromise between the moral ideals of appeasement and power politics. None the less, at the Imperial Conference of 1937 N. Z. agreed to co-ordinate her defence policy with that of Britain, and the nearer the clouds of the Second World War approached, the less did the N. Z. Gov. insist on its independent point of view, and the clearer became its sturdy resolve to stand by Britain. The Brit. declaration of war on Germany was regarded as binding on N. Z., and when war came New Zealanders stood loyally where their fathers had stood, side by side with Britain. The N. Z. Gov. agreed to send and maintain a force of 1 div. The achievements of this div., known as 2nd Div., under the command of Sir Bernard Freyberg, V.C. (q.v.) (who became governor-general in 1946), in Greece, Crete, at El Alamein, and in the advance to Tunis and in Italy, culminating in the final advance to Trieste, no less than the exploits of N. Z. members of the R.A.F.

and of the R.N. and an infantry div. which fought in the Pacific with U.S. forces, have added fresh lustre to the hist. of the country, besides emphasising her position as a loyal member of the Brit. Commonwealth of Nations. (See W. P. Morrell, *Britain and New Zealand*, 1944; A. J. Harrop, *New Zealand after Five Wars*, 1947; and the articles AFRICA, NORTH, SECOND WORLD WAR, CAMPAIGNS IN; ITALIAN FRONT, SECOND WORLD WAR, CAMPAIGNS OF; LONG RANGE DESERT GROUP.)

It was not until the end of 1947 that at long last N. Z. adopted the prin. sections (2-6) of the Statute of Westminster and passed a further Act asking the U.K. Gov. to legislate to relieve N. Z. of restrictions remaining, under an amending Act of 1857, on its powers to amend its own constitution, a request which was promptly acted upon by the passage of the New Zealand Constitution (Amendment) Act, 1949, repealing the New Zealand Constitution (Amendment) Act, 1857, and making it lawful for the Parliament of N. Z. 'to alter, suspend, or repeal, at any time, all or any of the provisions of the New Zealand Constitution Act, 1852.'

A national referendum held on 3 Aug. (1949) resulted in an overwhelming majority in favour of the Fraser Gov.'s proposals to institute compulsory military training in N. Z. The returns were: in favour, 533,016; against, 152,443. Sixty per cent of the electorate, including the Maoris, went to the poll. After 14 years in office the Labour Gov. was defeated by the National party, whose leader, S. G. Holland (q.v.), became Prime Minister (Dec. 1949). The Holland Gov. was soon faced with formidable trouble in the waterfront dispute which first began in June 1950, and eventually led to a long strike accompanied by disturbances which led to the formation of a Civil Emergency Organisation to assist in the maintenance of law and order. Ten thousand enrolments were made within a week. The creation of a new independent waterside workers' union proved a decisive set-back to the extremists, and the Prime Minister's firm attitude led eventually to the settlement of a protracted coal strike. On 11 July 1951 the Prime Minister announced in Parliament that the gov. would seek an early dissolution so that the electorate could give an early verdict on the handling of industrial disputes. At the election on 1 Sept., the gov. gained 53.6 per cent of the votes cast against Labour's 46.1, and won 50 out of 80 seats. Meanwhile the country had taken a full part in the U.N. intervention in Korea, 1500 volunteering for service on the first day and 5982 registering altogether for the special artillery force which was sent, with Brigadier R. S. Park in command.

In Mar. 1952 emergency measures taken to meet the financial situation included general licensing of imports, plans to expand production in export industries, and the pushing forward of the Murupara newsprint project. The Reserve Bank took steps to reduce the level of private

imports into N. Z., which had been running at £280 million annually. In Sept. it was announced that assisted immigration would be cut by one-third. The conclusion of the A.N.Z.U.S. pact between Australia, N. Z., and the U.S.A. was the subject of some criticism in the U.K. (which was excluded), but was defended by the Prime Minister as a necessary measure of insurance for the S. dominions.

For N. Z. the coronation of Queen Elizabeth II was made specially memorable by the announcement on the same day of the climbing of Mt Everest by Edmund Hillary and Tensing (qq.v.), members of Sir John Hunt's expedition. Hillary, a N. Z. apiarist, was knighted. He was subsequently selected to lead N. Z.'s Trans-Antarctic Expedition of 1956-8. The visit of the queen to N. Z. in 1953-4 was a triumphant success. Christmas 1953 was overshadowed by the Muir Trunk railway disaster at Tangiwha when 151 people lost their lives. In Parliament on 6 July 1954 the Hon. T. Clifton Webb, minister for external affairs, said that N. Z. regarded the formation of a SE. Asia alliance as a matter of extreme urgency. The SE. Asia Treaty Organisation consisted of the U.K., U.S.A., Australia, N. Z., France, Pakistan, Thailand, and the Philippines. Wider in scope than the A.N.Z.U.S. pact, it did not, however, replace that pact.

At the general election of 1954 Labour gained 5 seats and the state of the parties was National 45, Labour 35. On his return from the Commonwealth Conference early in 1955, the Prime Minister recommended that N. Z. should send a force to Malaya to help in the fight against Communist terrorists. In June 1955 the gov. appointed Foss Shanahan, deputy secretary for external affairs, as Commissioner in SE. Asia. The appointment reflected the increased interest and importance to N. Z. of developments in the SE. Asia area. In May 1956 the Prime Minister visited Japan, underlining his belief that a friendly understanding with that country was desirable. The seizure of the Suez Canal by Egypt in 1956 was deplored by both gov. and opposition in N. Z. The gov. subsequently supported Britain's military intervention in Egypt, though not warned of it in advance. In 1957 Sir Anthony Eden visited N. Z. after his health had broken down and he had resigned the Brit. premiership. In 1957 Holland, the N. Z. Premier, criticised the Brit. Gov.'s failure to warn him of the timing of the first hydrogen bomb test at Christmas Is. A N. Z. trade mission to London, led by the minister of agriculture, succeeded in obtaining a 10-year guarantee against any diminution in Britain's purchases of N. Z. dairy exports. In Sept. Holland retired from the leadership of the National party and was succeeded as Prime Minister by K. J. Holyoake (q.v.), his deputy. At the general election in Nov. 1957 the National party was defeated and the Labour party came into power, with the Labour leader Walter Nash (q.v.) as Prime Minister.

*Literature and art.* As might be

expected, the literary roots of N. Z. are English. In the early days of the colony the time and energies of the settlers were almost entirely taken up with the hard task of developing the country and winning a meagre existence from the soil. Contact with the Maori culture provided them with little else but material for the natural historian. The earliest writing to come out of N. Z. consisted of scientific accounts of the natural hist. and natives of N. Z. Among these early writers may be mentioned Edward Jerningham Wakefield, *Adventure in New Zealand*, 1845; Ernst Dieffenbach, *Travels in New Zealand*, 1843; Sir George Grey, *Mythology and Traditions of the New Zealanders*, 1854. Poetry was even less in evidence in these early years, although a certain amount of rough verse in ballad form was written and disseminated in broadsheets by such men as Wm Golder (c. 1850).

The overriding preoccupation with economics and commerce persisted into the latter half of the 19th cent., and Samuel Butler, who went to N. Z. in 1860, wrote scathingly of the prevailing concern with sheep. At this time a number of minor novelists appeared who wrote long and serious novels of a high moral tone with involved plots and a strong Puritan bias. Lady Barker wrote *Station Life in New Zealand*, 1870, and *Station Amusements in New Zealand*, 1873, and other works of a domestic and semi-fictional character; Mrs C. Evans and Dugald Forsuson were authors of a similar school. At this time also a hist. of the Maori wars was written by J. E. Gorst (later Sir J. E. Gorst, q.v.), entitled *The Maori King*, 1864, an important and absorbing account from first-hand observation. F. E. Manning's *History of the War in the North*, 1862, and *Old New Zealand*, 1863, are full of lively description. Among poets of the period may be mentioned F. N. Broome, Alfred Donnett (Browning's 'Waring'), and Thomas Bracken. Their work, however, was largely derivative and influenced by contemporary Eng. minor verse.

At the turn of the cent. the level of writing was improving, and perhaps the most noted author was Wm Pember Reeves, a well-known lawyer, politician, and journalist, author of *State Experiments in Australia and New Zealand*, 1902, *The Long White Cloud*, 1898, and writer of the national song *New Zealand*, 1898. Jessie Mackay, the poetess, belongs to this period, and Edith Grossman, the novelist, a strong supporter of the feminist movement.

At this time the cultured New Zealander was always strongly tempted to leave the somewhat prov. atmosphere at home and to migrate to London. Of such the most famous was Katherine Mansfield (q.v.). Born in Wellington in 1888, she was sent to school in London and returned to Wellington, only to leave again for England in 1909. Her stories and sketches have placed her among the foremost contemporary women writers. Another novelist, Wm Satchell, wrote between 1900 and 1914, and H. Guthrie Smith wrote *Tutira*,



a noted account of a N. Z. sheep station, in 1921. Guthrie Smith has been called the Gilbert White of N. Z., and his work has something of the imaginative qualities of both the poet and novelist. He gives a detailed account of the natural hist. of the locality, and also deals with man's influence on his natural environment, the habits and customs of the Maori, and the acclimatisation of European man and the effects of the various foreign flora and fauna which he introduced. Jane Mander wrote novels with N. Z. settings between 1920 and 1928.

After the First World War the quality of N. Z. literature improved considerably, and writers became emancipated from their Victorian models. From this time onward literary talent appears more frequently, though the domination of London is still apparent. The most promising poet in the 1920's was Eileen Duggan. Among novelists may be particularly mentioned Robin Hyde (the pseudonym of Iris Wilkinson), authoress of *Passport to Hell*, 1932, *Check to your King*, 1936, and many other novels, who was one of the most outstanding of the contemporary novelists. She has sensitive imagination and a great power of evocation. Present-day writers include Ngaio Marsh, John A. Lee, John Mulgan, Frank Sargeson, Guthrie Wilson, and Daniel Davin. Among poets may be mentioned Walter D'Arcy Cresswell, Evelyn Hayes, James K. Baxter, Ruth Dallas, A. R. D. Fairburn, Charles Brasch, Allen Curnow, Denis Glover, and Louis Johnson, who also writes prose stories. M. H. Holcroft, who is essayist, novelist, and journalist, and Alan Edward Mulgan, who has written literary criticism, may also be recalled. With the new contacts and widened horizons brought about by the war and modern communications the outlook for modern N. Z. writing is encouraging.

As with literature, so also the origins of N. Z. (European) art date back to about 1800 (for Maori art see MAORIS), and the first efforts are few and far between, owing to the hard life led by the early colonists. Some of the early painters were draughtsmen in the employ of the N. Z. Co. and their task was to record various phases of the company's operations and activities. Among these may be mentioned Charles Heaphy, W. Swainson, and J. A. Gilfillan, who portrayed N. Z. life and scenery in the 1840's and 1850's. Their style is perhaps conventional and lacking in any great distinction, but faithful to detail. Those of the generation which followed were rather idealists who were greatly under the influence of contemporary Eng. traditions. John Gully, for example, employed hazy blues and greens more appropriate to the atmosphere of the Brit. Isles. Mention may be made of J. C. Richmond and W. M. Hodgkins, but the most important artist of the period was John Buchanan, a water-colourist, who dispensed with the prevailing naturalism and placed the chief stress on form and contour. By about 1870 a number of art schools had been

estab. in N. Z. and art societies founded and galleries opened; the N. Z. Academy of Fine Arts was founded in 1889 and thenceforth art flourished in its own right. At the same time a Dutch professional artist, Van der Velden, settled in N. Z., and it was he who provided a stimulus to N. Z. students. James Nairn emigrated from Scotland and introduced impressionism to N. Z. at this time. By 1900 it had, however, become customary for N. Z. artists to study in London and Paris, with the result that the level of technical competence was raised considerably, though inevitably some talent was permanently lost to the country, e.g. David Low, the famous cartoonist, and Frances Hodgkins. However, with the general improvement in communications after the First World War and the consequent spread of ideas, N. Z. artists responded to outside influences to a much greater extent. The influence of the Fr. post-impressionists has been great and, while it is difficult to single out any name in particular among contemporaries, the following deserve mention: T. A. McCormack, Stewart MacLennan, Russell Clark, A. J. C. Fisher, Cedric Savage, Vida Steinert, George Woods, E. Mervyn Taylor (noted for his fine woodcuts and engravings), and Eric Lee-Johnson (painter, lithographer, and designer).

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**New Zealand, Bank of**, estab. in 1861 by an Act of the New Zealand Parliament, and has now more than 250 branches in Australasia. It acts as banker to the New Zealand Gov., which holds practically all the capital stock.

**New Zealand Alps**, mt range of S. Is., New Zealand, running 200 m. southwards from Arthur's Pass down the W. side of the is. The rock is largely a sandstone felspar combination called greywacke. Sixteen mts rise above 10,000 ft, all situated near the centre of the range. Their names, from N. to S., are Malte Brun, 10,421 ft; Etie de Beaumont, 10,300 ft; Minarets, 10,058 ft; Douglas Peak, 10,107 ft; Haidinger, 10,178 ft

(with a N. Peak, 10,030 ft); Lendenfeld, 10,450 ft; Haast, 10,294 ft; Torres, 10,376 ft; Tasman, 11,475 ft; Teichelmänn, 10,370 ft; Silberhorn, 10,757 ft; Mount Cook, 12,349 ft; Dampier, 11,287 ft; David's Dome, 10,443 ft; La Pêrouse, 10,101 ft; Sefton, 10,354 ft. These mts are 3000 ft lower than the Swiss Alps, but of equal height from the practical view of the climber, for the valley floors are lower in proportion. The range is much more heavily glaciated than the European Alps. The Tasman glacier, on the E. side of Mt Cook, is 18 m. long and more than 1 m. wide. The Franz Josef, on the W. side, although much shorter is fed so heavily from its upper snow-fields (150 ft annually) that it flows to within 600 ft of the sea. Its measured movement at one point is 15 ft daily. There are no subalpine passes across the central sector of the Main Divide. The lowest is Copland Pass, 6950 ft, between Hooker and Copland valleys. Other useful passes are Graham's Saddle, 8739 ft, between the Rudolf and Franz Josef glaciers, and Pioneer Pass, 9000 ft, between the Haast and Fox glaciers; neither pass is easy. The weather of the N. Z. A. is notoriously unstable. The range lies just 20 m. from the Tasman Sea, whence heavy N.-westerly storms break upon the main ridge. These warm, wet winds precipitate on the high peaks and lesser ranges eastwards, and are dry when they cross the Canterbury Plains. They seldom deposit snow below 8000 ft. Good Alpine weather comes with the cold southerly winds, and these, if prolonged, deposit snow down to 4000 ft. The summer climbing season extends from mid Nov. to early April. Feb. and Mar. are reckoned the least unsettled months. Winter weather is much better than summer. Skiing is thus a popular sport. Alpine climbing started much later than in Europe. Mt Cook was first explored by the Rev. W. S. Green with 2 Swiss guides in 1882, but the first ascent was not made until 1894, when the summit was won by 3 New Zealanders, Fyfe, Clarke, and G. Graham. One of the earliest pioneers was E. A. Fitzgerald, who came with Zurbriggen in 1895 and climbed Mts Tasman, Silberhorn, Sefton, and Haidinger. Much exploratory and survey work was carried out during the last decade of the cent. by Douglas, Harper, Mannering, and sev. others. Malte Brun was climbed in 1894 and the Minarets in 1897. No more of the high peaks fell for 9 years, but from 1906 to 1912 all save one of the 16 were climbed. The last, Teichelmänn, held out until 1929. Much of the finest climbing and exploration is to be found on peaks below 10,000 ft, the best known of which, in Otago, are Mts Aspiring, 9975 ft; Earnslaw, 9250 ft; Tutoko, 9042 ft; Stargazer, 7810 ft. Red deer abound on the lower hills and do much damage. Chamois thrive on the N. part of the range. The kiwi has become a rarity. Recent years have seen great increase in the numbers of New Zealand mountaineers. The leading club is the New Zealand Alpine Club, formed in 1891. As a training ground for the

world's great ranges the N. Z. A. are not inferior to the Swiss and Fr. Alps, save in rock-work, and in some respects must be reckoned better, notably in ice-work, and in their demand for approach-marching with heavy loads, dangerous river-crossings, and high camping. See W. S. Green, *The High Alps of New Zealand*, 1883; E. A. Fitzgerald, *Climbs in the New Zealand Alps*, 1896; A. P. Harper, *Pioneer Work in the Alps of New Zealand*, 1896; S. Turner, *The Conquest of the New Zealand Alps*, 1922; J. D. Pascoe, *Unclimbed New Zealand*, 1938; R. Hewitt and M. Davidson, *Mountains of New Zealand* 1954.

'New Zealand Herald,' estab. in 1863, the only morning newspaper in Auckland, circulates throughout Auckland city and prov. Substantial coverage is given to world, national, and local affairs with special emphasis on agriculture. It is New Zealand's largest and most influential daily newspaper. An associated pub. is *The Weekly News*, circulating throughout New Zealand.

Newark, Lord, see LESLIE, DAVID.

Newark: 1. N.-on-Trent, municipal bor. and parl. div. of Notts, England, on the navigable branch of the R. Trent, 16 m. SW. of Lincoln. The par. church combines sev. architectural styles, with 15th-cent. Perpendicular predominating; a Norman crypt and part of the central piers indicate an earlier church. N. castle, in which King John d. in 1216, was founded in 1135, and rebuilt in 1170 and c. 1280. The ruined NW. facade and main gateway form an attractive feature of the public gardens there. There are manufs. of ball and roller bearings, agric. and other machinery, metal foundings, special kinds of plaster, a beet sugar factory, sev. maltings and breweries, and a good corn market. Pop. 23,500.

2. City, co. seat of Licking co., Ohio, U.S.A., 33 m. E. of Columbus. The trade centre of an agric. region, it does aluminium processing and manufs. glass and electrical and petroleum products. Indian mounds are near by, and Denison Univ. is 7 m. away at Granville. Pop. 34,300.

3. City and port of entry of New Jersey, U.S.A., co. seat of Essex co., on N. Bay, and 9 m. W. of lower Manhattan. It is the largest city in the state, known as a major centre for transhipment of rail, water, and truck freight; the deep-water terminal (Port Newark) and Newark Airport are units of the Port of New York. Newark produces electrical equipment, machinery, wire and metal products, fountain-pens, cutlery, leather goods, celluloid, chemicals, pigments, paints, paper products, beverages and food products, and jewellery; it has meat packing and fur dyeing, and is an important insurance centre. Newark colleges of Rutgers Univ., Newark Academy for Boys, a state teachers' college, a junior college, and Newark College of Engineering are here, and there is a public library founded and developed by John Cotton Dana. Newark has many historical shrines and buildings, and is the bp. of Stephen Crane. Pop. 438,776.

Newbottle, par. in the co. of Midlothian, comprises the mining vils. of Newton-grange (pop. 6000) and Easthouses (pop. 5000). N. Abbey, 1 m. S. of Dalkeith, was built by David I in 1140.

Newbery, John (1713-67), publisher and bookseller, b. Waltham St Lawrence, Staffs. When 17 years old he went to Reading and procured employment in the *Mercury* offices. In 1745 he opened a publishing house in St Paul's Churchyard; here he started newspapers, and amongst his contributors were Johnson and Goldsmith. He had often meditated a library for young people, and the venture, when made, proved a great success. The well-known books, *Goody Two Shoes* and *Tommy Trip and his Dog Growler*, may be recalled, also the *Lilliputian Magazine*. It seems that the writers of these stories under the titles 'The Renowned Story of Giles Gingerbread' and 'Miss Mangery Two Shoes' were the brothers Giles and Griffith Jones. They appeared in N.'s Juvenile Library, and also in the 'Lilliputian Histories' written by the Jones brothers.

Newbold and Dunstan, see WHITTINGTON and NEWBOLD.

Newbolt, Sir Henry John (1862-1938), barrister and poet, b. Bilston, Staffs, where his father was vicar. He was educ. at Clifton College, Bristol, and Corpus Christi, Oxford. (Called to the Bar in 1887, he practised for 2 years. He ed. the *Monthly Review*, 1900-4. In 1892 his first book, *Taken from the Enemy* (a Napoleonic novel), was pub., and in 1895, *Mordred*, a tragedy. But his fame rests chiefly on the poems in *Admirals All* which appeared in *Longman's Magazine* in 1897. He was knighted in 1915 and became a C.H. in 1922. He also wrote *The Island Race*, 1898, *Stories from Froissart*, 1900, *The Sailing of the Longships*, 1902, *Songs of the Sea*, 1904, *The Year of Trafalgar*, 1905; *The Old Country*, 1906, *Songs of the Fleet*, 1906, *The Teymans*, 1911, *Poems, New and Old*, 1912, *Book of the Blue Sea*, 1914, *Book of the Thin Red Line*, 1915, *Tales of the Great War*, 1916; *Book of the Happy Warrior*, 1917, *Book of the Long Trail*, 1919, *Book of Good Hunting*, 1920, *Naval History of the War*, 1920, *Studies, Green and Gray*, 1926, and *New Paths on Helicon*, 1927. N.'s romances had their own charm, but they were not altogether successful in challenging the conventional methods of the historical novel. His *The Year of Trafalgar*, 1905, works out a convincing explanation of Nelson's and Collingwood's tactics in the battle, and, with its appendix of Trafalgar poems and ballads, gave him a reputation as a naval historian as well as a naval poet. Some years later he was invited to complete the work of Sir Julian Corbett as the official naval historian of the First World War. His own unofficial naval hist. is written with more freedom. He was prof. of poetry in the Royal Society of Literature from 1911 to 1921. See W. Archer, *Poets of the Younger Generation*, 1902, and C. Kernahan, *Six Famous Living Poets*, 1922.

**Newbridge** (*Droichead Nua*), tn in co. Kildare, Rep. of Ireland, on the Liffey, 6 m. N.E. of Kildare, and H.Q. of development of fuel resources of the Bog of Allen. Pop. 3000.

**Newburgh**: 1. Royal and municipal burgh and seaport in Fifeshire, Scotland, on the Firth of Tay. Its chief manufs. are linoleum and oilskin. It is also engaged in salmon fishing. Pop. 2500.

2. City in Orange co., New York, U.S.A., on the Hudson R., 60 m. N. of New York. Its chief manufs. are cotton and woollen goods, silk, machinery, tiles, medicines, and aluminium products; it also has shipbuilding. Pop. 31,950.

**Newburn**, urb. dist. in Northumberland, England, on the Tyne, 5½ m. W. of Newcastle. Industries are coal-mining, steel products, glass, bricks, and cordage. Pop. 23,740.

**Newbury**, municipal bor. and mrkt tn of Berks, England, on the R. Kennet, 17 m. SW. of Reading. Close by is the hamlet of Speen, built on the site of the Rom. *Spinæ*. During the Civil war the neighbourhood of Newbury was the scene of 2 battles, neither of them being decisive. During the second of these battles, Donnington Castle, resisted the Parliamentarians, being held by its governor Sir John Boys. One m. SW. of Newbury on the Andover Road is a memorial to Lucius Carey, second Viscount Falkland, who fell in the first battle of Newbury. The tn has sev. light industries. One of the local occupations is the training and stabling of racehorses, and there is a well-known racecourse. Pop. 18,310.

**Newburyport**, city, port of entry, and co. seat of Essex co., Massachusetts, U.S.A., on the Merrimack R., 37 m. NNE. of Boston. The prin. industries are the manuf. of boots, shoes, electrical apparatus, tools, and machine-shop products; there is also distilling. It is a former shipping, whaling, and shipbuilding centre. The city has a safe harbour and a fishing industry. N. is also a summer resort. Pop. 14,110.

**Newcastle**, 1st Duke of, *see* CAVENDISH, WILLIAM.

**Newcastle**, Thomas Pelham-Holles, 1st Duke of (1693-1768), politician, educ. at Westminster School and Cambridge; eldest son of the first Baron Pelham, assumed the name of Holles in 1711, on succeeding to the estates of his uncle, John Holles. He was a supporter of George I. and consequently in 1715 was created Duke of N. He was appointed lord chamberlain in 1717, and secretary of state for the S. Dept in 1724. Thirty years later he succeeded Pelham as Prime Minister, and in 1757 formed a coalition with Pitt, in which the latter was the dominant figure. He was lord privy seal in Rockingham's first administration (1765-6). *See* N.'s correspondence with Chesterfield (ed. Sir R. Lodge), 1930.

**Newcastle**: 1. Tn of Natal, S. Africa, near the Drakensberg Mts, about 130 m. NW. of Pietermaritzburg. Coal is mined in the dist. and there are 2 blast furnaces with a capacity of 150,000 tons of pig iron per annum. Iron ore exists in great

quantities locally. Good climate and beautifully situated at the base of the Drakensberg Mts. Pop.: Whites, 3000; Bantu, 7891; Asiatics, 2297; Coloured, 267.

2. City and port on the Hunter R., New S. Wales, 100 m. N. of Sydney. It is the largest tn of New S. Wales outside the metropolis, and is dependent mainly on coal-mining and the iron and steel industries. N. Harbour (Port Hunter) is the second port of New S. Wales and the fourth port of Australia in regard to the volume of its shipping trade. It ships coal, iron, steel, wheat, wool, and frozen meat. N. is primarily a coal-loading port, and the proximity of the coal-fields has led to the estab. of important industries, including the very up-to-date iron and steel works in the dist. The city of N. is 38 sq. m. in area and the pop. is 134,980. The pop. of N. urb. area (comprising the city and portion of adjoining Lake Macquarie Shire) is 181,740.

3. Tn of New Brunswick, on the Miramichi R., close to its mouth. It is the site of a large pulp and paper mill. Pop. 4248.

4. Popular seaside resort of co. Down, N. Ireland, on the W. fringe of Dundrum Bay. Pop. 3000.

5. **Newcastle-West**, mrkt tn in co. Limerick, Rep. of Ireland, 25 m. SW. of Limerick. Pop. 2700.

**Newcastle-under-Lyme**, market and industrial centre, parl. and municipal bor. of Staffs, England, 2 m. W. of Stoke-on-Trent. A castle was built here between 1142 and 1146; now only the excavated boundaries remain. St Giles's Church dates from the 13th cent., but was largely rebuilt between 1873 and 1876. N. is an important marketing centre for the dist.; its hist. shows great industrial progress during more recent years. The chief industries include coal-mining, tile making, textiles, wires and cables, electric lamps and equipment, and paper. In 1932 the bor. was extended to include Wolstanton, Chesterton, and Silverdale. Pop. 70,230.

**Newcastle upon Tyne**, parl and municipal bor., episcopal city, par., and also a city and co. of itself, situated on the N. bank of the R. Tyne, about 8 m. from the mouth of the riv. and the N. Sea, 272 m. N. of London. The city is within the geographical co. of Northumberland, England, but was created a co. of itself by charter of Henry IV in 1400. It was made a city in 1882. It is a quarter sessions bor. and an assize tn, with its own sheriff since 1400. The chief magistrate of the city has been styled mayor since 1216; the title of lord mayor was granted by Royal Charter under seal in 1906. The area of the municipal bor. is 11,401 ac. and it is divided into 4 parl. constituencies. There are 19 municipal wards, each returning 3 councillors to the city council, and there are 19 aldermen. The city is the seat of the bishopric of N., created in 1882 by the severance of Northumberland and N. from the ant. see of Durham. Between N. and Gateshead on the opposite bank the Tyne is spanned by 5 bridges: the Tyne bridge, opened in 1928 by King

George V, with 2 main piers of steel and granite and a parabolic arch of steel lattice framework rising to a height of 193 ft above high-water mark; the swing bridge, which was opened in 1876; the high-level bridge, designed by Robert Stephenson, son of George Stephenson, and opened in 1849; King Edward VII bridge, opened in 1906; and the Redheugh bridge, built in 1870 but reconstructed in 1900.

N. has a long and interesting hist. The ground-plan of the Rom. station of *Pons Aelii*, situated on Hadrian's Wall (q.v.), is preserved, and many Rom. relics are in Blackgate (the Castle) Museum. Between the departure of the Romans and the Conquest there is no evidence to show that the site of N. was occupied. It was formerly surrounded by a wall over 2 m. long, begun in the latter part of the reign of Henry III. As a port N. became an important wool exporting centre during the 13th cent., while by the end of the 14th cent. the beginnings of an export trade in 'sea cole' to London and the S. had been firmly estab. The coal trade increased rapidly after the Reformation, when many of the coal-mines were wrested from eccles. hands and exports increased from 35,000 tons in 1565 to 400,000 tons in 1625.

Among the most notable of the public buildings is the cathedral, dedicated to St Nicholas of Myra, formerly the par. church of N. Tradition has it that the church of St Nicholas was founded by Osmund, Bishop of Salisbury, in 1091, but it is believed that a church was standing on the site long before then. The Norman church was destroyed by fire in 1216 and was replaced by a building in the Early Eng. style. The church as it is to-day is mainly the work of 14th-cent. builders, apart from the Perpendicular tower and steeple, built about 1430. St Mary's Rom. Catholic cathedral was built in 1844 from the design of Pugin, and its tall, graceful spire was added in 1872. All Saint's Church, planned by David Stephenson, was completed in 1796 on the site of an earlier church which was demolished; St Andrew's Church dates from the middle of the 12th cent. The church of St John the Baptist is mainly of the 14th and 15th cents. St Ann's Church was built in 1768 with stones from part of the tn wall. The church of St Thomas the Martyr (John Dobson, architect) was built in substitution for the old chapel of St Thomas on Tyne bridge, pulled down in 1830.

The castle, placed by the corporation in the care of the N. Society of Antiquaries, was probably called the New Castle to distinguish it from the older royal Northumbrian castle of Bamburgh, or perhaps 'new' was used in relation to the *Pons Aelii*. A castle was built on the site by Robert, son of William I, in 1080; though nothing of this survives, remains of the Norman wall are still to be seen. To-day the expression 'the Castle' denotes only the keep or tower. Of the S. wall more extensive remains are extant, including the Postern Gate. The keep was built by Henry II between 1172 and 1177. The

original appearance of the building has been entirely altered by the erection of battlements in 1810. The Black Gate is a later addition built by Henry III about 1249. The great hall of the castle has a modern roof, but the chapel is a fine example of late Norman architecture.

The guildhall on the 'Sandhill' is the ant. centre of municipal gov. of the tn. There is evidence of the existence of a guildhall as early as the 13th cent. The old guildhall was rebuilt and enlarged in the middle of the 17th cent. by Robert Trollop, and most of the interior of the present building dates from 1658. The ground floor is now a commercial exchange. In the hall on the upper floor the freemen of the city still hold their ann. Michaelmas guild meeting, and the commissions of assize are opened there by the circuit judges, though all cases are normally tried at the Co. Moot Hall (1810); since 1952 the guildhall has served as an overflow court. Near by are interesting Elizabethan houses.

Opening on the quayside are a number of narrow lanes called charas (from a Saxon word meaning 'to divide'). Near the site of the Pilgrim Street Gate stood the once famous monastery of the Grey Friars of N., where Duns Scotus is said to have been a brother. The many public buildings include the Mansion House, Jesmond, and the new city hall and baths (1928). Near by is the site of the Barras bridge, traditionally that of the long-drawn-out single combat (1388) between Harry Hotspur and the Earl of Douglas before the battle of Otterburn. Barras Bridge is now the site for N.'s new tn hall and civic centre. The Hancock Museum of Natural Hist. in Barras Bridge contains the collections of the Natural Hist. Society of Northumberland, Durham, and Newcastle, and also a large series of the original work of Thomas Bewick (1753-1828), the famous wood engraver, who was b. near N. Colleges and schools include Rutherford College and the College of Commerce, Dame Allan's School (a boys' public school founded 1705), and the Royal Grammar School (1525). The old school buildings were demolished in 1844, the new buildings in Jesmond being occupied in 1906. King's College was constituted in 1937, as the Newcastle div. of the univ. of Durham, by the merger of Armstrong College with the College of Medicine. Armstrong College was founded in 1871 as the Univ. of Durham College of Physical Science; the College of Medicine was founded in 1834 as the N. upon Tyne School of Medicine and Surgery. The main block of buildings was opened by King Edward VII in 1906, the new medical school by King George VI in 1939. The central public library contains over 200,000 vols., apart from MSS. Near by is the Laing Art Gallery.

During the 19th cent. Richard Grainger (1798-1861), a native of N., together with John Dobson, architect, and John Clayton, tn clerk, laid out a number of streets as part of his scheme for the development of the tn centre. Grey Street and Grainger

Street are the most important of these; the street plan being laid out before the building of the Central station (designed by John Dobson, and opened by Queen Victoria in 1850). Grey Street was made the widest as being the chief approach to the town from the S. The new buildings of the Royal Victoria Infirmary (founded 1751) were opened by King Edward VII in 1906. More recent buildings include Carlisle House (N.E. Electricity Board), Central Police Station, and Prudhoe

engineering and boiler-making shops, locomotives, chemical works, and lead and copper works. The exports, apart from coal, are iron and steel goods, machinery, chemicals, copper, cotton, canvas, linen, woollen and jute goods, firebricks and fireclay goods, oils, oil fuel (as cargo and bunkers), pitch, tar, and resin; the chief imports are burnt ore, sulphur ore, chemicals, cement, grain, fruit and vegetables, iron manufs., iron ore, petroleum, steel manufs., and timber.



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THE TYNE BRIDGE, NEWCASTLE UPON TYNE

House (Ministry of Labour). In Eldon Square near by is the city war memorial (1914-18).

N.'s commercial prosperity is due to its position on a tidal riv., and to the large quantity of excellent coal found in the neighbourhood. The quay (2436 yds long), which is equipped with all mechanical appliances and communicates with Brit. Railways, forms a fine thoroughfare (Quayside) over a m. in length. It is the property of the corporation and some of the berths are of a depth of 30 ft at low water. The banks on both sides of the Tyne are lined with wharves, factories, warehouses, and shipbuilding yards. Between the Scotswood Road and the riv. are the Elswick shipyard, ordnance, and engineering works of Vickers-Armstrong Ltd (see also ARMSTRONG, SIR WILLIAM GEORGE, 1st BARON). The chief industries, apart from shipbuilding and ship repairing, are iron and steel manufs.,

There are a number of parks, recreation grounds, and open spaces, including Jesmond Dene, Brandling, Armstrong, and Heaton Parks, the Tn Moor (927 ac.), and Castle Leazes. Among the societies founded in N. are the Tyne-side Naturalists' Field Club (1846), the N. of England Institute of Mining Engineers (1852), the N. Society of Antiquaries (1813), and the Literary and Philosophical Society (1793). Pop. 291,724 (1951 census); 275,100 (1957 estimate). See J. Brand, *History and Antiquities of Newcastle*, 1789; R. J. Charlton, *History of Newcastle upon Tyne*, 1950; S. Middlebrook, *Newcastle upon Tyne: its growth and achievement*, 1950; R. Hugill, *Official Guide to Newcastle upon Tyne*, 1956.

Newchwang, or Yingkow a former treaty port in S. Manchuria, China. The town proper stands on the Liao R., 40 m. from the coast, but the name is usually applied to the port, 30 m. nearer the coast

of the Gulf of Laotung, which was originally called Muh-kow-yung. The Liao It. is here about  $\frac{1}{2}$  m. wide, but the port is ice-bound in winter. The surrounding country is flat and marshy. The chief industry is the manuf. of bean oil and bean cake which form the chief exports, with raw beans, ginseng, and raw silk. There are gold, iron, and silver mines. The U.S.A. and Great Britain abrogated their extra-territorial rights in 1943. Pop. 106,000.

**Newcomb, Simon** (1835-1909), Amer. astronomer, b. Nova Scotia. In 1861 he was appointed prof. of mathematics to the U.S. Navy, and later astronomer at the naval observatory, Washington, where he superintended the erection of the 26-in. equatorial telescope. From 1871 to 1874 he was secretary to the U.S. commission for observing the transit of Venus, and in 1882 observed the same at the Cape of Good Hope. In 1894 he was appointed prof. of mathematics and astronomy to Johns Hopkins Univ., but continued to reside in Washington, where he remained director of the *American Nautical Almanac* till 1897. N. studied chiefly the problems of gravitational astronomy. His *Reminiscences of an Astronomer* was pub. in 1903.

**Newcomen, Thomas** (1663-1729), inventor of the atmospheric steam-engine, b. Dartmouth. In 1705, together with Savery and John Calley, he took out a patent for a 'fire-engine' notable for its safety and economy. The engine of James Watt improved upon this by the use of a separate condenser. In 1723 he set up an engine for drawing water at Griff, near Coventry.

**Newdigate, Sir Roger**, 5th Baronet (1719-1806), antiquary, was a collector of anc't marbles, vases, and books. He is now principally remembered as the founder of the N. prize for Eng. verse at Oxford.

**Newel**, or **Newel-post**, in a wooden staircase: a post fixed at the top and bottom of each flight, to carry the hand-rail and strings, which are framed into the posts. In Elizabethan and Jacobean mansions, newel-posts were often richly carved.

**Newell, Robert Henry** (1836-1901), Amer. humorist, b. New York. Taking up journalism, in 1858 he became assistant editor of the New York *Sunday Mercury*, and during the Civil war wrote the *Orpheus C. Kerr Papers*, which with typical Amer. humour satirised humbug and pretentiousness, the chosen pseudonym being a pun on 'office seeker,' a type then very common. In 1870 N. pub. *The Cloven Foot*, one of many attempts to complete Dickens's unfinished *Edwin Drood*.

**Newfoundland**, is. prov. of Canada, formerly a Brit. dominion, situated between 46° 37' and 51° 39' N. lat., and 52° 35' and 59° 25' W. long., on the NE. side of the Gulf of St. Lawrence; the greatest length from N. to S. is 350 m., and average breadth about 130 m. Its estimated area is 42,734 sq. m. and the pop. (1956), including Labrador, is 420,000. In shape

it resembles an equilateral triangle, of which Cape Bauld on the N., Cape Race on the SE., and Cape Ray on the SW. form the angles. By the decision, on 1 Mar. 1927, of the Judicial Committee of the Privy Council, the Atlantic watershed of the Labrador peninsula, including the basin of the Hamilton, was awarded to Newfoundland (see LABRADOR). The remainder of the Labrador peninsula forms part of Quebec prov. The boundary was fixed as follows: a line drawn due N. from the E. boundary of the Bay of Ance Sablon as far as 52° N. lat., thence W. up to the Romaine R., and then N. along the l. b. of that riv. and its head waters to their source, thence due N. to the crest of the watershed, and thence W. and N. along the crest of the watershed of the rivs. flowing into the Atlantic until it reaches Cape Chidley, at the entrance to Hudson Strait. The is., as seen from the sea, presents a wild and sterile appearance. Its surface is diversified by mts, marshes, barrens, ponds, and lakes. The mts in the Avalon Peninsula (stretching SE. from the main portion of the is., and connected with it by an isthmus of only about 3 m. in width) rise, in some cases, to 1400 ft above sea level; and along the W. shore the height of 2500 ft is frequently reached. The number of lakes is remarkable, and it has been estimated, though perhaps with some exaggeration, that about one-third of the whole surface is covered with fresh water. The 'barrens' occupy the tops of hills. The coast-line is everywhere deeply indented with bays and estuaries affording safe harbours. Of these inlets the prin., beginning from the N. extremity of the is., are Hare, White, Notre Dame, Bonavista, Trinity, Conception, St Mary's, Placentia, Fortune, St George's, Bay of Is., and St John's Bays. The rivs., none of which is navigable for any distance, link the lakes of the interior with the shore, and are narrow and winding; occasionally they are used to drive machinery. The main streams are the Exploits, with its tribs. the Great Hattling and the Badger, Gander Gambo, Terra Nova, and the Humber. The soil is to a great part sterile and unproductive, although there is considerable cultivation along the seaboard of the settled dists. As regards the coast of Labrador assigned to Newfoundland in 1927, the outside coastline is bleak, but the shores of the bay and rivs. are well wooded, and in some cases densely so, the timber being high and sound. The temp. of the interior is similar to that of N. Canada.

There are in Labrador about 8000 permanent inhab. (1500 Eskimos, the remainder being of Brit. descent), occupied in the fisheries and in trapping. The pop. is greatly increased in summer by fishermen and sportsmen. The Newfoundland cod fishery is world famous and was the mainstay of the is. when first it became permanently settled. Salmon, halibut, lobster, herring, caplin, and seal are also caught; the whale fishing has declined. Goose Bay (Hamilton Inlet) is the chief port. The 1955 mineral

production was valued at \$70,317,255; production of the forests was valued at \$85,000,000; and estimated value of the fisheries was \$25,000,000.

The chief export to the U.K. and the U.S.A. is paper; to Europe iron ore. The total value of exports, 1955, was \$148,000,000. Great beds of haematite iron ore have been found at Bell Is., Conception Bay, and large quantities are being exported. Buchan's Mine, Red Indian Lake, produces lead and zinc concentrates. Copper is worked in Notre Dame Bay, and silver, nickel, chromium, antimony, asbestos, and vanadium are also found, but they have not yet been shown to be commercially workable. Over 131,000 tons of fluorspar were exported in 1955. The estab. of large and well-equipped paper mills at Grand Falls by the Anglo-Newfoundland Development Co. opened up a very large industry. The paper is shipped to the U.K., Australia, and the U.S.A., and used in the prin. London printing offices. A model tn has been laid out with all necessary public utility services. Botwood is the prin. port for summer shipments from the Grand Falls mills. There are also large paper- and pulp-mills at Corner Brook. These were formerly owned and operated by the International Power and Paper Co., but were taken over by a subsidiary of Bowater's Paper Mills. The total export of newsprint in 1955 was 533,285 tons, and of pulpwood 100,000 cords. Local secondary industries carried on at St John's and outposts include gypsum wallboard, knitting-mills, tanneries, cement, textiles, cotton-mills, aerated waters, breweries, boots and shoes, leather, and mattresses. By the Education Act, 1949, the central administration is vested in the Dept. of Education, presided over by the minister of education. A general training school for teachers was opened in 1921, and in 1925 the Newfoundland Memorial Univ. College was opened. It was incorporated as the Newfoundland Memorial Univ. in 1949. Lord Rothermere is the chancellor. The chief tns are St John's, the cap. city. Corner Brook, Wabana, Grand Falls, Windsor, Carbonear, Stephenville, Channell-Port aux Basques, and Deer Lake.

**History.** The early hist. of Newfoundland is somewhat obscure. It was discovered on 24 June 1497 by John Cabot. It was visited by the Portuguese navigator, Gaspar de Cortereal, in 1500, and within 2 years regular fisheries had been estab. on its shores by the Portuguese, Biscayans, and French. Sir Humphrey Gilbert, with his ill-fated expedition, arrived in St John's harbour, Aug. 1583, and formally took possession of the is. in the name of Queen Elizabeth. On the return voyage the expedition was scattered by a storm, and the commander lost. The hist. of the is. during the 17th and part of the 18th cents. is little more than a record of rivalries and feuds between the Eng. and Fr. fishermen; but by the treaty of Utrecht (1713) the is. was ceded wholly to England. A representa-

tive assembly was created in Newfoundland in 1832. In 1846 a terrible fire destroyed half the cap., a hurricane overwhelmed a large number of fishing craft, and the potato crop failed through blight. In 1855 the is. was given responsible gov. In 1860 the fishery partly failed, a reminder that Newfoundland depended primarily on the bounty of nature, and this period of adversity only ended in 1869. Two years previously Newfoundland seemed to be enthusiastic for membership of the Canadian Confederation and provision to that effect was actually made in the draft of the British North America Act. Opposition to the Federal party in Newfoundland, however, resulted in the is. refusing to join, the reasons being a fear of Canadian dominance, the is.'s interests as a fish producer, and the vagueness of the terms offered. In 1880 the first Railway Bill was passed for the construction of a light railway from the cap. to Hall's Bay, and by 1884 the line was completed as far as Harbour Grace, but it was not until 1891 that it was extended to Trinity and Bonavista Bays. In the eighties there were difficulties with the U.S.A. over fishing rights in Brit. N. Amor. waters and the ensuing negotiations resulted in a treaty which provided for delimitation; but it was only in 1912 that this question was finally settled by a new treaty. Meanwhile Amer. fishing vessels had been given, as from 1888, the right to facilities and amenities by ann. licence at a fee of \$1.50 a ton. In 1894 the banks failed owing to the failure of customers to realise on their catches of fish, and one effect of this crisis was to expose the weakness of the credit system on which the fishing industry was conducted, and the distrust engendered in the confused conditions of this period has never been wholly dispelled. In this period of economic adversity Newfoundland sought admission to the Dominion of Canada (see also *Federal Union with Canada* below).

The period from 1895 to 1914 was one of abundant promise, marred at first by a lack of statesmanship which nearly prejudiced the future of the is., and in its final stages by a programme of public expenditure which, if well intentioned, was economically unsound. Long previously the is.'s gov. might have realised the disadvantages resulting from dependence on a single industry, the fisheries. With the estab. of the Anglo-Newfoundland Development Co.'s pulp-mill at Grand Falls, the development of the iron-ore mine at Bell Is., the completion of the railway, and the opening up of the W. coast to settlement, it was felt that Newfoundland had gone far towards freeing itself from complete dependence on the fishery, but this could only be the case if the price of the chief fish, the cod, remained high in the world's markets. After the First World War an illusory prosperity from the high price of cod was to prove the undoing of the is.'s whole economy when the world depression of the 1930's hit Newfoundland. Newfoundland had lived beyond its means and continued



to do so in spite of the fall in the price of its fish. Furthermore, the natural resources of the is. had been recklessly dissipated, the land mostly being held for speculative purposes instead of being developed. Moreover there were political malpractices, and it was the rule rather than the exception that members of an administration and their supporters obtained what benefits they could during their party's tenure of office. Hence the budget remained unbalanced for 12 successive years, and the interest charges on

finances until such time as Newfoundland might again become self-supporting. The Brit. Gov. then appointed a commission of gov. of 6 (3 from Newfoundland and 3 not ordinarily resident in Newfoundland) under the chairmanship of the governor, and this new form of gov. assumed office on 16 Feb. 1934, and was still in being, albeit with changes in personnel, when the Second World War broke out.

The loyalty of the Newfoundlanders is proverbial. They are almost exclusively



NEWFOUNDLAND: DRYING COD IN WITLESS BAY

the public debt amounted to over 50 per cent of the average ann. revenue, there being no provision for a sinking fund. In 1928 Newfoundland was rapidly approaching insolvency, but there was no change in policy and further external loans were raised in 1928, 1929, and 1930. There was in fact a continuance of misgov. which only served to increase the burden on the fisherman and on the poorer members of the community (see the report of the Amulree Royal Commission, 1933). This commission was sent out to investigate the financial situation. Its report recommended that the existing form of gov. should be suspended and that a special commission of gov. should be formed with full legislative and executive authority, subject to the supervisory control of the Imperial Gov. in London. In fact, the Brit. Gov. assumed responsibility for the is.'s

Brit. and native born, and the overwhelming majority are of Eng. or Irish descent, not more than 3 or 4 generations removed from those born in the mother country. The outstanding seamanship of their fishermen has long been known in the R.N., and the special branch of the R.N.R., recruited exclusively from the is. seamen, was formed at the beginning of this cent. Newfoundlanders were present at the historic exploit of the *Vindictive* at Zeebrugge and at Suvla Bay in the First World War. On the W. front in that war they fought at Beaumont-Hamel, Monchy-le-Preux, and Ypres. At Beaumont-Hamel—where there is a memorial to them—on 1 July 1916 they went into action 753 strong, but next day only 68 answered the roll-call. In the Second World War men were recruited for heavy artillery brigades, for the Newfoundland Regiment, and as air pilots. Owing to

wartime employment revenue became more buoyant, but the surplus of \$2,250,000 owed something to the suspension of expenditure on the gov.'s plan for rural reconstruction.

In the Second World War some 7000 men joined the Brit. forces, in addition to 2000 enlisted in other dominion contingents and 3600 who served as lumberjacks in the forestry unit in Great Britain. Many of the islanders enlisted in brigades of heavy artillery, rendering distinguished service. Facilities for the estab., use, and protection of naval and air bases on the Avalon Peninsula and on the S. coast of Newfoundland were granted to the gov. of the U.S.A. in Sept. 1940. Under an agreement made in May 1946 between the gov.s. of Canada, Newfoundland, and the U.K. respecting defence installations constructed in the is. during the war, Canada gave back the control and operation of the airport at Gander and the seaplane bases at Glencables and Botwood to Newfoundland; and with a view to facilitating the development of the Gander airport as a civil airport, Canada gave up its rights under the lease granted in 1941. In consideration of taking over all the buildings, hangars, and works constructed by Canada at Gander the Newfoundland Gov. agreed to pay by instalments the sum of \$1,000,000. Under the same agreement the title to the lands of Torbay airport, in accordance with the understanding between the 2 gov.s. at the time that airport was constructed, was vested in the gov. of Canada for operation as a commercial airport for the air service between Newfoundland and Canada, but with equal facilities to the civil and military aircraft of both countries. The last article of this agreement provided for joint consultation between all 3 parties to the agreement on the co-ordination of defence requirements in the is. Canadian and U.K. military aircraft have the right to fly over Newfoundland and use its airports without payment of landing fees.

*Federal Union with Canada.* In 1947 representatives of the Canadian Gov. and of the Newfoundland National Gov. met at Ottawa to determine whether an equitable basis could be found for federal union between the 2 countries. During the war, in July 1943, Mackenzie King (q.v.) in the Canadian House of Commons stated that his gov. would give sympathetic consideration to any request by Newfoundland for incorporation in the dominion. The door was thus reopened for consideration of an old and difficult controversy, perhaps under more hopeful auspices than on previous occasions. In 1864 Newfoundland had been invited to join the provs. of Brit. N. America, which, in view of their strategic situation during the Amer. Civil War, were then contemplating the federal union that subsequently evolved into the dominion of Canada; but after attending the preliminary negotiations Newfoundland withdrew. Thirty years later (1894) the position was reversed. Canada was advancing in pop.

and wealth, and a delegation went to Ottawa to discuss the possibility of terms of admission; but when Canada was asked to assume the whole public debt of Newfoundland, which was then standing at \$16,000,000, the negotiations again broke down. Thirty years later still the position was again reversed following the Privy Council award in 1927 to Newfoundland of the coast of Labrador. Newfoundland thus technically became a continental power and Canada suggested union, but this time Newfoundland objected. Within 10 years the is. was again approaching insolvency, as shown earlier in this article. From 1934 Newfoundland was administered by a commission appointed from London, and under this body the economic position improved, but politically it could hardly be more than an interim solution and the time therefore seemed opportune for a renewal of the discussion. The public debt had by 1943 increased from \$16,000,000 to \$100,000,000, but what was an insuperable objection in 1894 appeared less in proportion to the dominion of 1943; while on the other hand the potential resources of Newfoundland in timber, fish, and minerals are considerable, but their development may be beyond the power of the islanders alone.

*Question of the status of Newfoundland.* From 1941 there was a decided change in the employment situation and this was reflected in the revenue returns, which showed a surplus for the first time for many years, the surplus in 1943-4 being nearly \$10,000,000 on a revenue of \$28,601,000. This change was not due to any industrial revival but merely because of the Allies' use of the strategical advantages of Newfoundland as a defence base, which meant remunerative work in almost every class of employment. It was realised that this prosperity was transitory, though it had not ended in 1947-8 when the estimated revenue of \$35,702,500 was higher than in any year except 1946-7, basic industries operating to capacity, while there was still full employment at the airports and the Amer. bases. In these circumstances a movement was started to urge the redemption of the pledge made by Britain in 1934 that, when the is. was again self-supporting, the former constitution would be restored. To ascertain whether Newfoundland was restored to a self-supporting basis and what form of gov. the people desired, the Brit. Gov. in Oct. 1946 set up an elected National Convention of 45 members to make recommendations on possible future forms of gov. which should be placed before the people in a referendum. The Convention was in session for 15 months and cost over a million dollars. It was interested at first in one thing only, the restoration of responsible gov. or the retention of commission gov. The deliberations were protracted by reason of the fact that in the meantime the question of union with Canada was under discussion between the Canadian Gov. and a delegation who went to Ottawa to ascertain what fair and equitable basis might exist for

federal union with Canada.' Three months later the delegation returned with terms which seemed adequate and even generous; but there were fears in Newfoundland about income tax and Canadian competition in trade. The anti-Confederates suggested that the terms had not been negotiated (the members of the Convention were ordinary citizens and in most cases lacked the knowledge necessary to deal with involved financial and economic matters) and that in any case terms should only be discussed by a properly constituted Newfoundland Gov. In its final vote (28 Jan. 1948) the Convention decided by 29 votes to 16 that union with Canada should not be recommended as a possible choice. Instead the Convention recommended 2 choices only for the ballot paper, the continuation of commission gov. and the return of responsible gov. But the Convention did not have the last word. It merely made recommendations to the Brit. Gov. and the latter decided that 3 choices should be placed before the people, including union with Canada, added because there was a substantial minority in the Convention in favour of considering it. There were manifest advantages in joining Canada, including substantial financial grants and social service benefits. The result of the first referendum showed over 60,000 votes each for confederation with Canada and a return to responsible gov. and only 22,000 for the retention of gov. by commission. As none of the 3 choices secured a vote greater than the combined total of the other 2 a second referendum was thought to be necessary. But on 22 July a referendum was held only as between a return to responsible gov. and union with Canada. At this referendum a clear vote was secured in favour of Canadian confederation, despite much bitter feeling among a large section of Newfoundlanders. It then only remained for Newfoundland representatives to negotiate with the Canadian Gov. for the final terms of union for submission to the Canadian Parliament, with whom the final decision rested.

The terms of the agreement for taking Newfoundland into the Canadian confederation were signed in Ottawa on 11 Dec. 1948 by representatives of the Canadian Gov. and the Newfoundland delegation, the operative date for union being 31 Mar. 1949, subject to the approval of the terms by the Canadian Parliament and the Newfoundland Gov. The Canadian Commons having passed the necessary resolution, and the Newfoundland Gov. also assenting to the terms, the Brit. Gov., in accordance with the joint request of Canada and Newfoundland, gave its assent to union by an Act of Parliament confirming the agreement. Under the agreement the services taken over by the dominion gov., thereby relieving the new prov. (now the tenth prov. of Canada) of the public costs incurred in respect of them after they had been taken over, were: the Newfoundland railway, including some shipping and other marine services; the Newfoundland Hotel;

telegraphic services; civil aviation; customs and excise; defence; protection of fisheries; geological, topographical, geodetic, and hydrographic surveys; light-houses, buoys, and beacons; radio broadcasting system; and some other public services.

See H. J. Hatton and M. Harvey, *Newfoundland: England's Oldest Colony*, 1897; J. G. Millais, *Newfoundland and its Untrodden Ways*, 1907; W. G. Gosling, *Life of Sir Humphrey Gilbert*, 1911; C. Seitz, *Newfoundland, the Great Island*, 1927; J. R. Smallwood, *The New Newfoundland*, 1931, and (ed.) *The Book of Newfoundland* (2 vols.), 1936; T. Lodge, *Dictatorship in Newfoundland*, 1939; A. H. McIntock, *The Establishment of Constitutional Government in Newfoundland, 1783-1832*, 1941; T. G. Taylor, *Newfoundland: a Study of Settlement*, 1946; R. A. McKay (ed.), *Studies on the History and Economy of Newfoundland*, 1946; also D. Creighton, *Dominion of the North*, 1958. See also Report of Royal Commission (Cmd. 4480), 1933, and Annual Reports by the Commission of Government, 1934-8. On Labrador see W. G. Gosling, *Labrador*, 1910; S. K. Hutton, *Among the Eskimos of Labrador*, 1912; Sir W. T. Grenfell, *Vikings of To-day*, 1898, *Labrador*, 1922, and *The Romance of Labrador*, 1934; E. Bruet, *Le Labrador et le Nouveau-Quebec*, Paris, 1949; J. Parker, *Newfoundland, Tenth Province of Canada*, 1950; V. Tanner, *Outlines of the Geography, Life, and Customs of Newfoundland-Labrador* (2 vols.), Helsinki, 1944, and Toronto, 1947.



T. Fall

## NEWFOUNDLAND DOG

**Newfoundland Dog.** Few breeds of dog are associated with so many accounts of canine instinct, devotion, and sagacity as the N. D., which was introduced, probably in the late 18th cent., from Brit. N. America, where it had been accustomed to a very hard life on rough fare, and had long been bred for intelligence and taught to take to water without hesitation. It is in fact unrivalled as a water dog, and is much assisted by the oily nature of its dense, straight coat and by its partly webbed feet. Newfoundlanders of the time when Sir Edwin Landseer immortalised the breed by his painting, 'A Distinguished Member of the Humane Society,' were of various colours. But there are

now 2 estab. varieties, the black and the white and black. Other colours, such as bronze or red and white, are not favoured. In both varieties the head is broad and massive, with short and square muzzle, small ears, and small deep-set eyes without haws. The back is broad, neck strong and short, legs very strong, and the feet large and round. The chest is deep and broad, and the tail thick and long enough to reach just below the hock. The general appearance is that of a dog of great strength and activity for its build and size. The movement is free, and the loose swinging of the body between the legs, giving a slight roll to the gait, is characteristic. According to the Newfoundland Club's standard, the weight should not be less than 110 lb. for a bitch and not more than 140 lb. for a dog, while the average height is put at 25 to 27 in. respectively, although somewhat larger animals are not uncommon. Newfoundland puppies need plenty of lean meat, both raw and cooked, as soon as they are able to take it, and they must have regular and frequent exercise.

**Newgate Prison**, former prison in London, situated at the W. end of Newgate Street. The date of its origin is not known, but it was in existence by 1190. It was common practice in walled cities to use gates as prisons (in London, Cripple-gate and Ludgate were also used), but N. P. was reserved for the worst class of criminals. It became notorious for overcrowding, lack of air and water, and for epidemics. About 1425 the executors of Richard Whittington, at his request, applied part of his property for the rebuilding of the jail, and this building, although damaged in the Great Fire, was used until 1767, when another rebuilding began. Before this was complete (1783) the prison was attacked and set on fire by the Gordon Rioters, when 300 prisoners were let loose (see Dickens's *Barnaby Rudge*). When the place of execution was moved here from Tyburn (1783) it became one of the shows of London to see the executions outside N. P., until all public executions were stopped in 1868. It was at Newgate in 1813 that Elizabeth Fry (q.v.) began her work of prison reform. Debtors, who had latterly been admitted, were no longer allowed in N. P. after 1815. In 1881 it ceased to be a prison except for those awaiting trial at the Central Criminal Court, and in 1902-3 it was demolished. The large list of well-known persons who have been imprisoned at N. P. includes Titus Oates, Defoe, Wm Penn, Jack Sheppard, and John Wilkes. See also OLD BAILEY. See ARTHUR GRIFITHS, *The Chronicles of Newgate*, 1902.

**Newhaven:** 1. Seaport tn of Sussex, England, 6½ m. S. of Lewes, on the Eng. Channel at the mouth of the R. Ouse, protected by a breakwater extending 2400 ft seawards. N. is a bonding port, with a daily cross-channel service to Dieppe, and coastguard and lifeboat stations. Places of interest include a 12th-cent. Norman church, a fort dominating the entrance to the harbour, and

buildings of old walling made from boulders collected on the shore. Pop. 7832.

2. Scottish fishing tn, part of the city of Edinburgh (q.v.), on the Firth of Forth.

**Ne Win** (1910- ), Burmese soldier and politician, one of the 'Thirty Comrades' who went to Japan. He was commander of the Burma National Army, 1943-5, a Jap. colonel, and commander of Patriotic Burmese forces. M.P., 1947, brigadier, 1948, commander-in-chief, major general, 1949, defence minister, 1949-50.

**Newlands, John Alexander Reina** (1838-1898), Eng. chemist. After 1865 he practised as an analytical and consulting chemist. His name is associated with the conception of the theory of periodicity among the chemical elements—the law of octaves—later developed by Mendeleeff and Lothar Meyer. His papers on the subject were collected in *The Discovery of the Periodic Law*, 1884.

**Newlands**, suburb of Cape Town, S. Africa, on S. slopes of Table Mt. Favourite residential area with famous cricket and Rugby football grounds.

**Newlyn**, see PENZANCE.

**Newmains**, tn of Lanarkshire, Scotland, 2 m. N.E. of Wishaw, with ironworks and steelworks, and a large factory for pre-cast concrete. Pop. 6396.

**Newman, Ernest** (1868- ), music critic, b. Liverpool. He was music critic for the *Manchester Guardian*, 1905-6, the *Birmingham Post*, 1906-19, and then, having settled in London, for the *Observer* at first, soon going over to the *Sunday Times*, to which he has remained attached. N. has pub. important books on music; the first to attract attention being *Gluck and the Opera*, 1895. A short book on Wagner first showed his special interest in that master, 1904. Similar works on Elgar, 1906, and Richard Strauss, 1908, are necessarily limited by their dates, but *Hugo Wolf*, 1907, has remained a standard work on the subject. Later works were *Wagner as Man and Artist*, 1914, a collection of essays *A Musical Molloy*, 1919, *A Musical Critic's Holiday*, 1925, *Fact and Fiction about Wagner*, 1931, and *The Man Liszt*, 1934. All the earlier Wagner books, however, were in the nature of studies for his monumental *Life of Richard Wagner*, 1933-47, a biography in 4 vols. in which all the accessible facts are marshalled with masterly lucidity and discussed with incomparable psychological insight; *Wagner Nights*, *Opera Nights*, and *More Opera Nights* were the later vols. in the nature of very superior guide-books for opera-goers. N. trans. most of Wagner's music-dramas as well as Schweitzer's *J. S. Bach*, 1911, and Romain Rolland's *Beethoven the Creator*, 1929. See *Fanfare for Ernest Newman*, 1955.

**Newman, Francis William** (1805-97), scholar and man of letters, younger brother of Cardinal N., b. London. Educ. at Oxford, in 1826 he became a fellow of Balliol, but resigned in 1830 through conscientious scruples, and travelled in the E., joining a Baptist mission at Bagdad. He returned to England in 1833,

and was classical tutor at Bristol College, 1834-40, prof. of classics at Manchester New College, 1840-6, and prof. of Latin at Univ. College, London, 1846-63. He then devoted himself entirely to literature. His divergence from the Church of England in the direction of theism and free thought forms a curious contrast to the religious development of his brother. His works include *Catholic Union*, 1844, *History of the Hebrew Monarchy*, 1847, *The Soul, her Sorrows and Aspirations*, 1849, *Phases of Faith, or Passages from the History of my Creed*, 1850, *The Odes of Horace translated into Unrhymed English Metres*, 1853, *The Iliad of Homer*, 1856, and *Theism. Doctrinal and Practical*, 1858. See M. Arnold, *Last Words on Translating Homer*, 1862, and J. G. Siveking, *Memoir and Letters of Francis W. Newman*, 1909.

**Newman, Sir George** (1870-1948), public health administrator, b. Leominster, educ. at Edinburgh Univ. (M.B., 1892), and at King's College, London. At Edinburgh he won the Gunning scholarship in public health, and took the diploma of D.P.H. at Cambridge in the same year (1895). He was senior demonstrator of bacteriology and lecturer on infectious diseases at King's College, London, 1896-1900. For a short time he was medical officer of health to Finsbury and to Beds, was chief medical officer of the Board of Education, 1907-35, and of the Ministry of Health from 1919 to 1935, in which latter year he retired. One of the chief architects of the modern system of public health administration, in addition to writing numerous official reports he was the author of books on *Bacteriology and the Public Health*, 1904, *Infant Mortality*, 1906, *Bacteriology of Milk*, 1908, *Hygiene and Public Health*, 1917, *An Outline of the Practice of Preventive Medicine*, 1919, and *Recent Advances in Medical Education in England*, 1923. Late in his career he wrote *Interpreters of Nature*, 1927, a series of biographies of leading figures in medical hist. His Halley-Stewart lectures on 'Health and Social Evolution' were pub. in book form in 1930; *The Rise of Preventive Medicine* appeared in 1932, and *The Building of a Nation's Health* in 1939. He was knighted in 1911.

**Newman, John Henry** (1801-90), Eng. cardinal, was the eldest child of John N., a banker. In 1816 he entered Trinity College, Oxford; 2 years later he gained a scholarship, and in 1820 he took his B.A. degree, having failed to obtain any high academic distinction. In 1822 he was awarded a fellowship at Oriel, the acknowledged centre of Oxford intellectualism, and in the following year the same honour fell to Pusey (q.v.). In 1826, when N. obtained a tutorship, Richard Froude became fellow. Having assisted Hawkins to the provostship of Oriel, N. was appointed to the vicarage of St Mary's, Oxford, which Hawkins had just vacated. After resigning their fellowships because Hawkins failed to recognise 'the substantially religious nature' of their office, N. and Froude went abroad to the Mediterranean and to Rome, where they composed many

of the short poems afterwards collected in the *Lyra Apostolica*, 1834. It was during this tour, whilst he lay becalmed in the straits of Bonifacio, that N. wrote the beautiful hymn, 'Lead, Kindly Light.' The Oxford Movement dates from N.'s return home. In July 1833 he resolved with Froude and a few other friends and thinkers to uphold the integrity of the Prayer Book, and to defend the doctrine of apostolic succession. In Sept. of the same year he began his *Tracts for the Times*, and whilst publishing these, he was expounding from the pulpit of St Mary's



CARDINAL NEWMAN

the doctrines therein expressed. A chief source of that torrent of religious feeling which passed forth from Oxford to all parts of the kingdom must be looked for in the intense spiritual conviction, the magnetic and fascinating personality, the eager intellectualism and singular dialectical faculty of N., at that time a leading Tractarian. It was his study of the early fathers, of Athanasius, Origen, and Clement, and of the Monophysite controversy, that first filled his mind with doubts as to the justice of his claims for Anglicanism. In 1841 he raised a storm of indignation against himself by his *Tract 90*, in which he argued that the Articles do not disavow Catholicism. He retired to Littlemore near Oxford in 1842, renounced the living of St Mary's in 1843, and at the same time recanted all his earlier adverse criticism of the Rom. Church. After three years of strict seclusion at Littlemore he was received into the Rom. Catholic Church in 1845. He was ordained in Rome in 1846 and returned to England as a member of the Congregation of the Oratory (see ORATORY or St PHILIP NERI). He founded the oratories at Birmingham (1847) and London (1850). In 1852 he was fined £100 for libelling an apostate monk, Achilli, notwithstanding his ample demonstration of the truth of his accusations. His splendid and dignified *Apologia pro vita sua* was a reply to the 'grave and gratuitous slander' which Charles Kingsley set down against him in *Macmillan's Magazine*, 1864. In it the author traces

his mental development with a frankness which must have been repellent to so sensitive a nature, but which must for ever silence any who are inclined to question the transparent purity of his motives or the singleness of his aims. From this 'Apology' it is clear that N. was from the first actuated by his conception of an infallible church, and that a longing to attain, or at least approach to this ideal alone induced him to transfer his allegiance to the Rom. Church, which seemed the one 'divine kingdom' on this earth. The 3 years of fasting, prayer, and meditation which he passed in comparative seclusion at Littlemore (1842-5) are a sufficient indication of the grave and earnest spirit in which he took this step. In 1878 he was elected honorary fellow of Trinity and in 1879 he was created cardinal by Leo XIII. The diocesan process with a view to his beatification was begun in 1958. One of the great masters of Eng. prose style, N.'s works include *Sermons*, *Lectures*, *Grammar of Assent*, 1870. See lives by W. Meynell, 1887; R. H. Hutton, 1891; W. P. Ward (2 vols.), 1912; G. G. Atkins, 1931; H. Tristram, 1948. See also T. Mosley, *Reminiscences* (2 vols.), 1882; R. W. Church, *The Oxford Movement*, 1891; Anne Mosley (ed.), *Letters and Correspondence*, 1891; I. Williams, *Autobiography*, ed. Sir G. Prevost, 1892; W. E. Bloss, *Twist the Old and the New: a Study in the Life and Times of Cardinal Newman*, 1916; J. J. Reilly, *Newman as a Man of Letters*, 1925; J. M. Flood, *Cardinal Newman and Oxford*, 1933; F. R. Cronin, *Cardinal Newman, his Theory of Knowledge*, 1935; R. D. Middleton, *Newman and Bloxham: An Oxford Friendship*, 1947; M. Ward, *Young Mr Newman*, 1948; L. Bouyer, *Newman*, 1958.

**Newmarket:** 1. Mkrt tn of Suffolk, England, 13 m. NE. of Cambridge. The fame of the tn rests on its races, racecourse, training and racing establs. The racecourse, adjoining the tn on the N., is owned by the Jockey Club and is said to be the finest in the world. The Jockey Club was founded between 1727 and 1760, when extensive buildings were erected. The horses are trained on the heath, where there is a great prehistoric earthwork known as the Devil's Dyke—40 ft wide and sev. m. long. In the tn is a house reputed to have been occupied by Nell Gwynne. Pop. 11,000.

2. Mkrt tn in NW. co. Cork, Rep. of Ireland. John Philpot Curran (1750-1817), (q.v.) was b. here, and his daughter, Sarah, fiancée of Robert Emmet, is buried here. Pop. 1450.

**Newmarket Stakes**, see HORSE-RACING.

**Newmilns**, burgh of Ayrshire, Scotland, on the Irvine, 7 m. E. of Kilmarnock. The burgh includes Greenholm on the other side of the riv. There are lace and Madras manufs. Pop. 4000.

**Newnes, Sir George** (1851-1910), magazine and newspaper publisher, b. Matlock, Derbyshire. He ensured his first success in the publishing world by his production of *Tat-Bits* in 1881. In 1885 he became a Member of Parliament, sitting for

Newmarket on the Liberal benches until 1895. In the latter year he was made a baronet, and 5 years later he became M.P. for Swansea. Among other magazines and papers which he founded or ed. are the *Strand Magazine*, the *Ladies' Field*, the *Wide World Magazine*, *Country Life*, and *C. B. Fry's Magazine*.

**Newnham College**, Cambridge, for the higher education of women, organised in 1873 and opened in 1875. The college was incorporated in 1880, and for 30 years the students enjoyed most of the scholastic privileges offered by the univ.; their names appeared in the tripos or honours lists, but they were not allowed to hold degrees. In 1917 a royal charter was obtained, and in 1923 women were admitted to degrees. In Dec. 1947 full membership of the univ. was granted. The buildings include Old Hall (1875), Sidwick Hall (1880), Clough Hall (1888), Pfeiffer Building (1893), Kennedy Buildings (1906), Pelle Hall (1910), Fawcett Building (1938), and the library. See Mary A. Hamilton, *Newnham*, 1936.

**Newport:** 1. Municipal and only co. bor. in Monmouthshire, England, situated at the mouth of the Usk, a parl. constituency and a mkrt and assize tn. The inhab. are engaged in shipbuilding, shipbreaking and repairing, iron, steel, and aluminium undertakings, the manuf. of chemicals, clothing, confectionery, rubber goods, and electrical equipment, and the shipping of coal and general merchandise. The dockage and wharfage are extensive. It was formerly a walled town defended by a castle, the ruins of which still stand. St Woolos Church, the cathedral of the diocese of Monmouth, dates from Saxon times. One of the few transporter bridges in the world spans the Usk. Pop. 105,000.

2. Municipal bor., mkrt tn, and riv.-port of England, chief tn of the Isle of Wight, situated near the centre of that is., on the R. Medina, which is navigable up to this point. Vessels of considerable tonnage can berth at the quays at high tides. St Thomas's Church, erected in 1854 on the site of an earlier church built in the reign of Henry II, contains a monument erected by Queen Victoria in memory of the Princess Elizabeth, daughter of Charles I, who d. at Carisbrooke (q.v.) Castle, 8 Sept. 1650. Carisbrooke is in the bor., and also Parkhurst, a growing residential dist., with the Albany Barracks, depot of many well-known regiments; Parkhurst Prison, the famous penal institution, and Camp Hill Prison; also St Mary's Hospital. N. has a number of light industries. Pop. 19,840.

3. Seaport and burgh of Fifeshire, Scotland, on the Firth of Tay, opposite Dundee. Pop. 3400.

4. City and co. seat of N. co., Rhode Is., U.S.A. It is a very fashionable summer resort, and has a good harbour and a naval training station and war college. Close by is situated the U.S. torpedo station and coastguard station. It has a fishery and manufs. of precision instruments, rubber goods, medical supplies, electrical equipment, and jewellery; there

is also a shipbuilding industry. It is the site of Touro Park and the seat of Salve Regina College. Pop. 37,564.

5. City and co. seat of Campbell co., Kentucky, U.S.A., on the Ohio R., opposite Cincinnati. There are flour-mills and iron foundries, and manufs. of machinery. Pop. 31,044.

Newport News, city and port in, but independent of, Warwick co., Virginia, U.S.A., on the James R. It has an excellent harbour, one of the world's largest shipbuilding yards, iron works, coal wharves, lumber mills, and dry docks. It has been the tidewater terminus since 1880 of the Chesapeake and Ohio R.s. Pop. 42,458.

Newport Pagnell, mkt tn of Bucks, England, 14 m. from Buckingham, on the Great Ouse, where it is joined by the Ousel. There is a 14th-cent. church. The main occupation is agriculture, and there are light industries. Pop. 5000.

Newquay, holiday resort on the N. coast of Cornwall, England, about 11 m. N. of Truro. Pop. 9600.

Newry, seaport of Down and Armagh cos., N. Ireland, one of the chief ports of Ulster, on Newry Water, near Carlingford Lough, 33 m. SSW. of Belfast. There are corn, flour, and spinning mills, and potato processing, textile, wheelbarrow, clothing, knitting, and tobacco factories; also breweries, with granite quarries near by. Pop. 14,000.

News Agency, for gathering news and supplying it to newspapers and for broadcasting, and also to private subscribers. To a certain extent the N. A. reporter has supplanted the newspaper reporter, the latter being now more often employed in 'descriptive' reports or on 'stories' which are of special interest to his particular newspaper. In practice the great London newspapers use foreign cables of the N. A. s merely to supplement their own services, the N. A. service (apart from Reuters) being useful mainly for home news. In England the most important N. A. is the Press Association, which was formed in 1868 when Parliament passed an Act empowering the state to take over the telegraphs. Its members are the prin. proprietors of the prov. newspapers (see PRESS ASSOCIATION). Another leading Brit. N. A. is the Exchange Telegraph Co., notable for its 'tape' service. Reuters is the chief agency in Britain for foreign news, and has correspondents in all parts of the world. The Press Association has the sole right of circulating Reuter telegrams in the provs. Besides general news the N. A. s also cover parl. reports, market news, and sport. The chief N. A. s of the U.S.A. are the Associated Press of America and the United Press Association of America, both with London branches.

'News Chronicle,' founded as the *Daily News* in 1846, under the editorship of Charles Dickens. From 1869 it was the recognised organ of the Liberal party in England. The *Daily News* was among the earliest papers to publish foreign telegrams. For years its only serious London rival in Liberal journalism was the *Morning Star*, which it bought up in 1870.

Later it became identified with Liberal imperialism; but after it was taken over by George Cadbury it became more 'progressive.' In 1928 the *Daily News* absorbed the *Westminster Gazette* (q.v.), and in 1930 the *Daily Chronicle* was also amalgamated with the *Daily News* under the present title *News Chronicle*, the sole Liberal daily paper in London. It incorporated the *Daily Dispatch* (q.v.), Nov. 1955.

'News of the World,' Eng. Sunday newspaper, founded in 1843. It was acquired in 1891 by the syndicate which still controls it, and is the only Eng. newspaper to be independently owned. The policy of the paper was admittedly sensational, giving more space than did any other to police court and divorce proceedings, and this has been maintained except for the restrictions in the latter subject enforced by the Judicial Proceedings (Regulation of Reports) Act of 1906. In addition a most comprehensive sports review is provided. Even in 1906 the sales of the *News of the World* exceeded 1,000,000; its present circulation is about 7,000,000.

Newspapers. *History.* It is not easy to trace the origin of the newspaper press, but at least it is clear that analogies with the Rom. *Acta Diurna* or the Venetian *Gazzetta* are very remote, and hardly less so with the old Eng. news-letter of the 16th cent. It was, in fact, essentially the invention of printing and the more or less accidental removal of restrictions on the liberty of the press that favoured the growth of modern N. According to Cicero, Petronius, and other writers, the *Acta Diurna* (called also *Acta Urbana* or *Publica*) pub. an account of anything worthy of note. But they are rather to be regarded as the official notification or registration of important public events than the voluntary presentation of news as a commercial speculation. It is recorded that the rep. of St Mark had its N., and it is very probable that we borrowed, if not the idea of a newspaper, many of the terms in familiar use to-day in connection with N. from the Venetians, e.g. the word 'gazette,' which word is apparently derived from the name of the coin charged for reading it. Like the *Acta Diurna* the Venetian gazettes were hung up in public places. The first man to print all the news of the day upon a single sheet, in a regular weekly pub. with a distinctive title, was Nathaniel Butter, who brought out the *Weekly News* in 1622. Up to that time the only means of circulating news was the news-letters, which were the MS. productions of professional London news-writers who collected the gossip and rumour of the city (see also JOURNALISM). There were, however, during the Civil war and the Commonwealth a great number of N., but their pub. was only by leave of the Star Chamber. The press became temporarily free on the abolition of the Star Chamber, but the Long Parliament, becoming frightened by the mass of pamphlets which were soon broadcast over the country, again subjected books and other reading matter to licensing regulations. At the Restoration

a most retrogressive step was taken in the passing of the Licensing Act, which vested in the gov. the entire control of printing. It was the non-renewal of this Act in 1695 on its automatic expiration that paved the way for the freedom of the press.

Among the earliest of Eng. N. after the Restoration were the *Protestant Intelligence*, the *Current Intelligence*, the *Domestic Intelligence*, the *True News*, and the *London Mercury*. But none of them printed debates in Parliament, and none exceeded in size a single small leaf, or was pub. oftener than twice a week. The first daily newspaper, the *Daily Courant*, was not pub. till the accession of Queen Anne in 1702. Even after the abolition of the licenser of books (including N.) there was another obstacle to the free pub. of N. in the shape of the Newspaper Tax, the Bill for which was passed as the Stamp Act in 1712. It was the old bugbear of sedition which prompted this device for killing the N., a device which was eminently successful, for not one penny paper survived, and even Addison's *Spectator* collapsed, while Steele incurred the wrath of the attorney-general for articles in the *Englishman* and the *Crisis*, which were held to be 'aspersions upon the character of Queen Anne, and assaults upon the conduct of the administration.' But the printers soon evolved means of evading the Stamp Act; and in this they were aided and abetted by the leaders of the opposition, to whose often scurrilous and venomous attacks on their political rivals we owe the beginning of the pub. of proceedings in Parliament. In 1738 Parliament seems to have taken steps to stop the practice of reporting, for the debates were thereafter pub. as if they had taken place in a fictitious assembly. But at the end of the 18th cent. public sympathy for reporting became too strong for parl. privilege, with the result that reporting gradually became recognised as lawful. Parl. reporting laid the seeds of the future prosperity of the *Morning Chronicle*. Thereafter N. quickly developed into a form more or less similar to that of to-day. The Stamp Act was finally repealed in 1855.

**British.** A modern newspaper derives its news from 2 main sources: its own staff of reporters and correspondents and the news agencies (q.v.). Inasmuch as the material sent out by the news agencies is common to all their newspaper subscribers, N. would differ little from each other if they did not import individuality and colour through their own staffs. The staff of a newspaper consists of a body of full-time reporters at the head office, who receive their daily assignments from the news editor, and the political, diplomatic, dramatic, and other correspondents, who are really reporters in a special sphere and often enjoy the confidence of influential persons. *The Times* is to-day the only newspaper to maintain its own press gallery staff in the House of Commons; other N. depend on agency reports and sketch writers, while lobby correspondents keep close contact with ministers and other Members of Parliament and

write on expected political and administrative developments. A staff of reporters is also kept at the law courts. The law reporters of *The Times* are required to be barristers and the pub. vols. of *The Times Law Reports* are accepted as authentic records of judgments. Under the news editor there are also correspondents in prov. tns who send in their copy by telegraph or telephone. The foreign news editor deals with the messages sent by the newspaper's correspondents abroad; distant messages are sent in by cable or radio-gram, but those from European caps. are normally sent over the telephone and taken down by dictaphone or in shorthand. A newspaper's correspondents, whether home or overseas, may be full-time staff men and required to work exclusively for the newspaper; others, in less important centres, may do other work and are paid a retaining fee and space rated. Distinctions such as 'our special correspondent,' 'a correspondent,' 'a special correspondent,' 'our correspondent,' 'our own correspondent' are all well understood in Fleet Street; the first and last of these only are staff men as opposed to outside contributors and mostly their remuneration is much higher. The miscellaneous mass of news from whatever source received is prepared for the press by subeditors, whose function is to select, compress, and correct and also to indicate the type and appropriate headings and subheadings. The selection among the copy is done by a copy-taster, who 'spikes' (i.e. defers indefinitely) some and passes the remainder to his colleagues with a symbol indicative of its importance; the selection within the copy itself is done by the subeditors, while the chief subeditor approves and revises the sub-ed. copy.

A modern newspaper is not, however, made up exclusively of news, and a large though very varying place is taken by 'features.' Thus the correspondence columns and the 'turnover' article are features of *The Times*, while birth, marriage, and obituary notices are a feature of both *The Times* and the *Manchester Guardian*. These are admitted in proof of pedigree at the College of Heralds. Social and political gossip is also a feature; others are political cartoons, and 'strip' cartoons, and cross-word puzzles. Apart from news and features, a newspaper should have leading articles or editorials. These may be important and influential, such as those in *The Times*, *Manchester Guardian*, *Daily Telegraph*, and *Yorkshire Post*, which are always closely studied by the politicians, and in the Brit. press 'leaders' are unsigned because they are the views or policy of the paper and not of an individual.

It is often said that advertisers exert an undue influence over editorial matter; but although a great part of the revenue of a newspaper comes from advertising, most Brit. N. now carry news on the front page, though *The Times* still devotes the whole front page to advertisements. Illustrations may be given to show that direct or indirect control by advertisers



might tend to become dangerous, but the danger may, on the whole, be said to be hypothetical. Again, though a high circulation enables advertising rates to be increased, nothing so damages the tone of a newspaper as competition for big circulation, and, generally speaking, the N. which have the greatest influence on public opinion have comparatively low but steady circulations among sections of the public whose support is politically valuable. It has been well said that in Britain the power of the N. to influence opinion and policy is, in fact, almost in inverse proportion to circulation, though the rule is, of course, not mathematically exact (cf. Ivor Thomas, *The Newspaper*, Oxford Univ. Press pamphlets on Home Affairs, No. II.2, 1943). For the outstanding features of novelty in modern journalism, and some remarks on Fr. and Amer. N., see JOURNALISM; for the hist. of individual N. see under the name of the newspaper, and for the hist. of advertisements in N. and their bearing on them see ADVERTISEMENT.

The outstanding feature of newspaper finance in more recent years has been the growth of combines controlling chains of N. One of the prin. groups is Associated N. Ltd, which owns the *Daily Mail*, *Daily Sketch*, *Sunday Dispatch* (qq.v.), *Evening News*, and a chain of prov. N. This company has a large holding in Anglo-Newfoundland Development Co. Ltd (see under NEWFOUNDLAND). Another large group was the Berry group, but the brothers Wm and Gomer Berry (Lords Camrose and Kensley, q.v.) in 1937 divided their interests. Lord Camrose became owner of the *Daily Telegraph* (q.v.), and Lord Kensley of the *Sunday Times*, *Sunday Graphic*, *Empire News* (qq.v.), and sev. prov. N. The Westminster Press Prov. N. Ltd, formerly known as the Starmer group, controls 3 morning, 9 evening, 1 bi-weekly, and 42 weekly N., all these being mainly in the Midlands, Durham, and Yorks. But the Brit. press shows most conceivable types of ownership. Most London N. used to be family properties and many prov. N. still are. *The Times* (q.v.) since 1922 has been held by Lord Astor of Hever and John Walter (see 'TIMES, THE'), but to prevent the paper from falling into undesirable hands the owners entered into an arrangement whereby any transfer of shares in the Times Holding Co. requires the consent of a body of trustees consisting of the lord chief justice, the president of the Royal Society, the governor of the Bank of England, and others. The control of the *Daily Express*, *Evening Standard*, and *Sunday Express* (qq.v.) is held by the Beaverbrook Trust. The *Daily Herald* (q.v.) is owned as to 49 per cent of its shares by the general council of the Trades Union Congress and as to 51 per cent by Odhams Press Ltd, who own entirely the *Sunday People*. The *News of the World*, credited with the largest newspaper circulation in the world, has prov. newspaper interests in the W. of England. The *Daily Mirror* and the *Sunday Pictorial* (qq.v.) are owned by interlocked

companies. The *News Chronicle* and the *Star* (qq.v.) are owned by the Cadbury family, the *Observer* (q.v.) by Viscount Astor, now under a trust formed in 1945; and *Reynolds News* (q.v.) by the Co-operative movement. The *Morning Advertiser* is the one example of a newspaper owned on behalf of a trade—the Licensed Victuallers. The *Daily Worker* (q.v.) is the organ of the Communist party. In Oct. 1953 Mr W. J. Brittain launched the *Recorder*, the first new daily newspaper, apart from the *Daily Worker*, to be put on the market for 41 years; unfortunately it ceased pub. in 1955.

*European*. The most important continental European daily papers (1957-8) are as follows (arranged in descending order of circulation within each country):

*Austria*. *Arbeiter-Zeitung*, Vienna, socialist, 235,000; *Die Presse*, Vienna, independent, 50,000.

*Belgium*. *Le Soir*, Brussels, independent, 310,000; *Het Laatste Nieuws*, Brussels, liberal, 310,000.

*Denmark*. *Bertlingske Tidende*, Copenhagen, conservative, 180,000; *Politiken*, Copenhagen, liberal, 150,000.

*Finland*. *Helsingin Sanomat*, Helsinki, conservative-independent, 245,000.

*France*. *France-soir*, Paris, independent, 1,400,000; *Le Figaro*, Paris, moderate right, 500,000; *Le Monde*, Paris, independent, 210,000.

*Germany (Federal Republic)*. *West-deutsche Allgemeine*, Essen, independent, 375,000; *Süddeutsche Zeitung*, Munich, independent, 250,000; *Die Welt*, Hamburg, independent, 200,000; *Frankfurter Allgemeine*, Frankfurt, independent, 160,000; *Der Tagesspiegel*, Berlin, independent, 100,000.

*Greece*. *Kathimerini*, Athens, conservative, 70,000; *Vradyni*, Athens, conservative, 60,000.

*Italy*. *Corriere della Sera*, Milan, independent, 500,000; *La Stampa*, Turin, independent, 250,000; *Il Messaggero*, Rome, independent, 180,000; *Il Tempo*, Rome, democratic, 175,000.

*Netherlands*. *Het Vrije Volk*, Amsterdam, socialist, 350,000; *De Volkskrant*, Amsterdam, Catholic, 160,000; *Nieuwe Rotterdamse Courant*, liberal, 55,000.

*Norway*. *Aftenposten*, Oslo, conservative, 150,000.

*Portugal*. *Diário de Notícias*, Lisbon, 140,000; *O Século*, Lisbon, 75,000.

*Russia*. *Pravda*, Moscow, communist, 5,000,000; *Izvestiya*, Moscow, communist, 2,000,000.

*Spain*. *A.B.C.*, Madrid, royalist, 100,000; *La Vanguardia Española*, Barcelona, 100,000.

*Sweden*. *Dagens Nyheter*, Stockholm, liberal, 300,000; *Aftonbladet*, Stockholm, 175,000; *Svenska Dagbladet*, Stockholm, conservative, 100,000.

*Switzerland*. *Tages Anzeiger*, Zürich, independent, 140,000; *Neue Zürcher Zeitung*, Zürich, liberal, 72,000; *Tribune de Genève*, Geneva, independent, 52,000; *National Zeitung*, Basel, radical, 50,000.

*Turkey*. *Hürriyet*, Istanbul, independent, 125,000; *Vatan*, Istanbul, liberal, 30,000.

*American*. Since the Franco-Ger. war the Amer. press has greatly influenced Brit. and European journalism. The use of the electric telegraph was without doubt first proved by Amer. correspondents in Europe at this time. A number of circumstances—the cheapening of paper, the development of setting and printing machinery, the reproduction of photographs to illustrate news items, and the estab. of powerful news agencies—tended to make N. in the U.S.A. of greater influence. It was also found convenient by wealthy men to be able to control a newspaper, or syndicate of N., for their own political or social advantage. The first Amer. newspaper was pub. in Boston, Massachusetts, under the title of *Public Occurrences*; 2 copies were issued, 1689 and 1690; both were suppressed by the gov. of Massachusetts. Next was the *Boston News Letter*, 1709, followed by the *Boston Gazette*, 1719. Further Massachusetts N. were the *New England Courant*, 1721, *Massachusetts Spy*, 1770, and the *Boston Sentinel*, 1784. The *Liberator* of Wm L. Garrison was pub. in Boston, 1831. Among modern Massachusetts N. may be mentioned the *Boston Record and American Post*, 1831, *Herald*, 1846, *Daily Globe*, 1872, and the *Christian Science Monitor*, 1908. The prin. N. in New York include *New York Journal-American*, 1788, *New York Post*, 1801, *World-Telegram and Sun* (q.v.), 1833, *New York Mirror*, *New York Herald Tribune* (q.v.), *New York Times* (q.v.), 1851, and *Wall Street Journal*, 1882. Chicago N. include *Chicago Tribune* (q.v.), 1847, *Herald American* (see HEARST) and *Chicago Daily News*, 1875, and *Chicago Sun-Times*, 1929. As an example of the growth of N. may be mentioned those in Pennsylvania, including *Pittsburgh Press*, 1824, *Philadelphia Inquirer*, 1829, *Philadelphia Bulletin and Bulletin*, 1847, *Allegha Mirror*, 1874, *Philadelphia Daily News*, 1925, and *Pittsburgh Post-Gazette*, 1927. Ohio N. include *Cincinnati Enquirer* and *Cleveland Plain Dealer*, 1841, and *Cleveland Press*, 1878. Other well-known N. include the *Kansas City Star-Times* and *Detroit Free Press*, 1831, *Baltimore Sun*, 1837, *Washington Post*, 1877 (*Washington Post and Times Herald*, 1954), and *Los Angeles Illustrated Daily News*, 1895. The 1957 ed. of Messrs N. W. Ayer & Son's *Directory of Newspapers and Periodicals in the U.S.A.* lists 334 morning papers with a total circulation of 21,576,000, 1482 evening papers (34,211,000), 8 all-day papers (809,000), and 536 Sunday papers (46,670,000). Amer. N., with very few exceptions, do not have a nation-wide circulation, and indeed they are not designed for that purpose. The exceptions are the *New York Times* and the *New York Herald Tribune*, which circulate into the Far W., even as far as California. Important Canadian N. include the *Halifax Chronicle-Herald*, 1875, *Montreal Gazette*, 1878, and the *Toronto Globe and Mail* (q.v.), 1844, *Evening Telegram*, 1876, and *Star* (q.v.), 1892. A leading S. Amer. paper is *La Prensa* (q.v.).

*Radio-facsimile newspapers*. Transmission of news by radio facsimile has made some progress in America since the Second World War. Before the war miniature N. were transmitted by nearby radio stations during the night and printed by a small unit fixed in place of a loud-speaker to an ordinary radio set which contained a device to shut off the machine automatically. By 1939 about a score of radio stations had estab. regular radio facsimile services. During the war these experiments had to yield to war work, though the armed services used the radio-facsimile process for transmitting orders. W. G. H. Finch is the pioneer of this process in America. The Finch transmitter consists of a scanning machine into which copy to be broadcast is inserted. The copy, printed or typewritten or drawn, is automatically wrapped round the surface of a spinning cylinder. Beside the cylinder is mounted a device called the scanning head, which consists of an electric bulb, lens system, and photo-electric cell. The lens focuses a spot of light which traces a closely spaced spiral line on the surface of the paper. This causes the lights and darks of the copy, made by letters or pictures, to reflect from the paper with the varying intensity of the photo-electric cell. From this impact of reflected light issues a high-pitched soft note, known as the facsimile carrier, which is applied to an ordinary amplifier and delivered to the radio transmitter in the same way as if it issued from a studio microphone instead of from a photo-electric cell. The home receiver picks up these signals and passes them to the attached recorder instead of to a loud-speaker. The recording instrument prints the incoming news and pictures on a continuous sheet of electro-sensitised paper, which reacts to the facsimile signal and shuts itself off when the printing is completed. It is now possible to use paper 5 columns wide, the size of a small newspaper, and to transmit at the rate of 48 sq. in. a minute, or more than 550 words of copy. An entire 4-page small-size newspaper has been transmitted in 8 min. Departmental stores have used the radio facsimile to send illustrations and copy in their advertisements directly into the home. It is possible to equip ships at sea with the service. One present difficulty is that it is not yet possible to transmit the regular 8-point type size clearly. The 12-point type, which is used, cuts down the number of words the paper can carry. Another difficulty is the high cost of the electrolytic paper required for radio-facsimile transmission. It is feared by some that even greater standardisation and monopolisation of news production may result from radio-facsimile N. But the fear that radio facsimile may make the regular newspaper obsolete is considered groundless.

*Royal Commission on the Press, 1947*. In response to a persistent demand of its supporters, the gov., in 1946, allowed a private member of the Labour party to bring forward a motion asking for the appointment of a royal commission to

inquire into the finance, control, management, and ownership of the press. The chairman of the commission, appointed in 1947, was Sir David Ross, provost of Oriel College, Oxford. The other members were M. E. Aubrey, general secretary of the Baptist Union; John Benstead, general secretary of the National Union of Railwaymen; Neil Beaton, chairman of the Scottish Co-operative Wholesale Society; Lady Violet Bonham-Carter, president of the Liberal party organisation; R. C. K. Ensor, historian and journalist; Eirwen Mary Owen, deputy regional commissioner for Welsh civil defence region during the Second World War; Hubert Hull, lawyer; J. B. Priestley, author; Wright Robinson, former lord mayor of Manchester; Gilbert Granville Sharp, recorder of King's Lynn; Lord Simon of Wythenshawe, chairman of the council of Manchester Univ.; Sir Geoffrey Vickers, legal adviser to the National Coal Board; Sir George Waters, formerly editor of the *Scotsman*; H. W. Wilson, chartered accountant; Barbara Wootton, reader in social studies, London Univ.; and G. M. Young, historian and author. The terms of reference were: 'With the object of furthering the expression of opinion through the press and the greatest practicable accuracy in the presentation of news, to inquire into the control, management, and ownership of the newspaper and periodical press and the news agencies, including the financial structure and monopolistic tendencies in control, and to make recommendations thereon.'

The report of the commission, issued on 29 June 1949, recommended the estab., by the press itself, of a general council of the press, 'to safeguard the freedom of the press; to encourage the growth of the sense of public responsibility and public service among all engaged in the profession of journalism—that is in the editorial production of newspapers—whether as directors, editors, or other journalists; and to further the efficiency of the profession and the well-being of those who practise it.'

Regarding chain N. the commission thought that such N. should carry a front-page formula indicating their common ownership; but concerning the allegations about monopoly, due to the growth in the series of chains, the assertion that the process had gone so far that a monopoly existed and that the chains were deliberately driving independent N. out of existence was wholly disproved by the commission's findings. Of the 5 chains (Prov. N. Ltd, Harnsworth chain, Associated N. Ltd, Westminster Press Prov. N. Ltd, and Kemsley N. Ltd) the Kemsley is the largest, its percentage of the total number of daily and Sunday papers being 17.18 in 1948. There were fewer daily and Sunday N. in the 5 chains in 1948 than in 1929. With the exception of 2 papers, whose lack of success could be attributed to other causes, no independent daily competing with a chain daily had ceased pub. since 1932. The commission found that the present degree of concentration of ownership in the press

as a whole or in any important part of it 'is not so great as to prejudice the free expression of opinion or the accurate presentation of news, or to be contrary to the best interests of the public.' It was suggested in evidence that individual or joint-stock ownership should be prohibited and papers be owned by gov.-licensed corporations. This the commission rejected as an 'unwarrantable interference with the liberty of the individual and the freedom of the press.' The commission saw no reason to believe that N. attached to the interests of political parties, trade unions, or other organisations would be better or have greater regard for truth and fairness than those N. pub. by private undertakings. It is generally agreed, the report states, that the Brit. press is inferior to none in the world. 'It is free from corruption; both those who own the press and those who are employed on it would universally condemn the acceptance or soliciting of bribes.'

It has been claimed that the report of the commission was a complete vindication of the press generally. But the commission gave reasons why in their opinion N., with a few exceptions, failed to supply the electorate with adequate materials for sound political judgment. On this the report stated: 'In the popular papers consideration of news value acts as a distorting medium even apart from any political considerations: it attaches, as we have shown, supreme importance to the new, the exceptional, and the "human," and it emphasises these elements in the news to the detriment or even exclusion of the normal and the continuing. Consequently the picture is always out of focus. The combination, day after day, of distortion due to these factors with the distortion arising from political partisanship has a cumulative effect upon the reader. It results, where it is carried furthest, not only in a debasement in the standards of taste, but also in a further weakening of the foundations of intelligent judgment in public affairs. Political partisanship alone, as we have indicated, deprives the citizen of the evidence on which conclusions should be based. Political partisanship in conjunction with a high degree of distortion for news value may lead him to forget that conclusions are, or should be, grounded on evidence.' Discussing the standards by which the press should be judged, the commission set down two requirements: firstly, that while the selection of news may be affected by a newspaper's political and other opinions the news it reports should be reported truthfully and without excessive bias; and, secondly, that the number and variety of N. should be such that the press gives an opportunity for all important points of view to be effectively presented. 'The first requirement is satisfied in very different measure by different papers. A number of quality papers do fully or almost fully meet its demands. But all the popular papers and certain of the quality fall short of the standard achieved by the best, either through excessive

partisanship or through distortion for the sake of news value. The provincial newspapers generally fall short to a lesser extent than the popular national newspapers. As to the second requirement, the press provides for a sufficient variety of political opinion but not for a sufficient variety of intellectual levels. The gap between the best of the quality papers and the general run of the popular press is too wide, and the number of papers of an intermediate type is too small. The causes of these shortcomings do not lie in any external influences upon the press (other than those exerted by public demand). The policy of the press is dictated neither by the advertisers, nor by the government, nor by any outside financial interests. . . . Nor do the causes of the shortcomings lie in any particular form of ownership. . . . We do not see a solution to the problems we have indicated in major changes in the ownership and control of the industry. Free enterprise is a prerequisite of a free press, and free enterprise in the case of newspapers of any considerable circulation will generally mean commercially profitable enterprise. The commission's report was debated in Parliament and by the newspaper proprietors (see First Annual Report of the General Council of the Press, 1954). In July 1953 the council was constituted, its objects being (i) to preserve the establishment of the press, (ii) to maintain the character of the British press in accordance with the highest professional and commercial standards, (iii) to keep under review any developments likely to restrict the supply of information of public interest and importance, (iv) to promote a proper functional relation among all sections of the profession, (v) to promote and encourage methods of recruitment, education, and training of journalists, (vi) to promote technical and other research, (vii) to study developments in the press which may tend towards greater concentration or monopoly, (viii) to publish periodical reports recording its own work and reviewing from time to time the factors affecting it. The council consists of 25 members, all directors or employees of N., periodicals, or news agencies. See also JOURNALISM; MAGAZINES; PRINTING.

See L. N. Flint, *The Conscience of the Newspaper*, 1925; A. Robbins, *The Press*, 1928; T. Clarke, *My Northcliffe Diary*, 1931; S. Morison, *The English Newspaper, 1622-1932*, 1932; H. de Jouvenel, *The Educational Role of the Press*, 1934; K. von Stutterheim, *The Press in England*, 1934; *History of 'The Times'* (5 vols.), 1935-1952; A. J. Cummings, *The Press*, 1936; H. W. Nevins, *Fire of Life*, 1936; J. Soames, *English Press*, 1937; R. Christingen, *Le Développement de la presse*, 1944; E. Howe, *The London Compositor: Documents relating to Wages, Working Conditions, and Customs of the London Printing Trade, 1788-1900*, 1947; I. Rothenberg, *The Newspaper*, 1947; Kingsley Martin, *The Press the Public Wants*, 1947; Viscount Camrose, *British Newspapers and their Controllers* (revised ed.), 1948; A.

Aspinall, *Politics and the Press, 1780-1850*, 1949; W. A. Bagley, *Illustrated Journalism*, 1949; F. Williams, *Transmitting World News: Telecommunications and the Press, 1953*, and *Dangerous Estate: the Anatomy of Newspapers*, 1957; A. P. Robbins, *Newspapers To-day*, 1956; T. S. Matthews, *The Sugar Pill: an Essay on Newspapers*, 1957. Ann. reference guides to the Brit. press include Willing's *Press Guide*. Other ann. reference guides are *The Newspaper Press Directory*, London; *Annuaire de la presse française et étrangère*, Paris; *Der Leitfaden für Presse und Werbung*, Essen; *Editor and Publisher*, International Year Book, New York.

**Newstead**: 1. Vil. of Roxburghshire, Scotland, on the Tweed, 1 m. E. of Melrose. Remains of a Rom. camp (Trimontium) built by the troops of Agricola were excavated in 1910, and in 1928 a monument was erected to mark the site. Weapons, armour, and coins (Augustus to M. Aurelius) were found. Pop. 175.

2. Or **Newstead Colliery**, par. and vil. in Notts, England, 9 m. N. of Nottingham, near the outskirts of Sherwood Forest. Its famous abbey was founded by Henry II in the latter half of the 12th cent., and it was granted by Henry VIII to the Byron family, who held it until 1818, when the 6th Lord Byron (the poet) sold it. It has since been restored and, with the gardens, was vested in the corporation of Nottingham in 1946. Pop. 2586.



NEWT

**Newt**, Eft, Asker, certain tailed amphibians of the family Salamandridae. Three species occur in Britain, viz. the common or spotted N. (*Triton vulgaris*), the great or crested N. (*T. cristatus*), and the rare webbed N. (*T. palmatus*). Of them, the crested N. is the most aquatic. Its head is flat and the upper lip overhangs the lower one. The upper parts of the body are blackish-brown with darker brown spots. The under parts are reddish-orange, with black spots. The sides are dotted with white, and in spring the colours of the rough skin brighten and the

notched crest comes into prominence. The male reaches a length of 5 or 6 in., while the common N. rarely exceeds half that length and the skin is smooth, though its colouring resembles the other.

**Newton, Alfred** (1829-1907), Eng. ornithologist, *b.* Geneva. In 1854 he was elected travelling fellow of Magdalene College, Cambridge, and visited many parts of the world. He pub. *Zoology of Ancient Europe*, 1862, *Ootheca Wolcyana*, 1864-1902, *Zoology*, 1872, and a *Dictionary of Birds*, 1893-6.

**Newton, Sir Charles Thomas** (1816-94), archaeologist, *b.* Bredwardine in Herefordshire. In 1852 he became vice-consul at Mitylene, and in 1853-4 consul at Rhodes. In 1854-5, aided by funds supplied by Lord Stratford de Redcliffe, he discovered an important series of inscriptions at the is. of Calymnos, and in 1856-7 he discovered the remains of the Mausoleum at Halicarnassus. In 1861 he was appointed keeper of Gk and Rom. antiquities at the Brit. Museum.

**Newton, Gilbert Stuart** (1794-1835), painter, *b.* Halifax, Nova Scotia. He first exhibited at the Royal Academy in 1818, becoming an associate in 1829, and an academician in 1832. His pictures include 'Don Quixote in his Study,' 1823, 'Captain Macheath upbraided by Polly and Lucy,' 1826, 'Yorick and the Grissette,' 1830, and 'Portia and Bassanio,' 1831.

**Newton, Sir Isaac** (1642-1727), mathematician and scientist, *b.* in the manor-house of Woolsthorpe-by-Colsterworth, near Grantham, Lincs, on 25 Dec., posthumous son of a farmer, Isaac N., and Hannah Ayscough. Educ. at the King's School, Grantham, and entered Trinity College, Cambridge, in June 1661, graduating in 1665. His great discoveries of the differential calculus, many of the properties of light, and the law of universal gravitation were all made in his twenty-third and twenty-fourth years while he was spending an enforced vacation at home owing to an outbreak of the plague. Returning to Trinity College he was elected a fellow, took his M.A. degree, and in 1669 was appointed Lucasian prof. of mathematics in succession to his teacher, Isaac Barrow. His election as a fellow of the Royal Society in Jan. 1672 led to controversies extremely wearisome to N. Previous to this, from 1665 to 1667, he was engaged largely in mathematics, having studied Descartes's geometry, and invented the binomial theorem, the method of tangents, and the fluxional calculus (the discovery of fluxions, which he claimed, was contested by Leibnitz, and led to a long and bitter controversy between the 2 philosophers), his paper *Analysis per Equations Numero Terminum Infinitas* leading to his professorship. In 1666 his thoughts were directed by the falling of an apple, according to Voltaire, to universal gravitation. From Kepler's second law he deduced the law of inverse squares and applied it to the motions of the moon; but did not complete his verification till he had Picard's new value (69.1 m.) for the length of a degree of lat., which was found in 1672. In 1684 he

wrote *De Motu*, which was presented to the Royal Society. This was the germ of his great work, and with additions formed the first book of his *Philosophiæ Naturalis Principia Mathematica*, written 1685-6, during which time he was in constant correspondence with the astronomer royal, Flamsteed, chiefly on the subject of measurements of planetary orbits. The whole work was pub. in 1687. In 1689 N. was elected to represent his univ. in the Convention Parliament. During 1692-3 he passed through a period of serious illness, with loss of appetite and marked



SIR ISAAC NEWTON

Engraving after the original picture by Vanderbank, in the possession of the Royal Society.

insomnia. He was at last, in 1694, largely owing to the efforts of John Locke, appointed by Charles Montagu warden of the Mint, and 3 years later master. The year 1701 saw him again in Parliament, but he was defeated at the polls in 1705. He became president of the Royal Society in 1703, and was annually re-elected for the remainder of his life. He was knighted by Queen Anne in 1705. His *Optics* was pub. in 1704. In 1714 N. gave evidence before a committee of the House of Commons on the question of finding long, at sea. He was interested in theological studies and the anc. prophecies. After his death his *Observations upon the Prophecies of Daniel and the Apocalypse of St John* and his *Chronology of the Ancient Kingdoms Amended* were pub., but nothing explicit concerning his views on the Trinity, which were believed to be Aryan and unorthodox, ever appeared. Amongst his great friends must be reckoned Halley, who persuaded and cajoled N. into writing his *Principia*; had not Halley exercised the greatest tact, the crowning part of the book would have been suppressed by N., for fear of controversy. Yet the work has been described as one of the greatest feats of the human intellect, for it contains not only the explanation of the planetary

orbits, worked out in terms of universal gravitation and N.'s laws of motion, and of the behaviour of comets, but a host of other achievements of the first importance. It also gives the basis of mathematical physics, in particular of the science of fluid movements. It has been remarked that science was N.'s supreme interest only for short and separated periods, and in the intervals he displayed not only a lack of interest in physical science but sometimes even an actual distaste for it. It is certainly significant that he made no attempt to publish his great discoveries of the calculus, universal gravitation, and prismatic decomposition of light, and nothing on the calculus or on gravity appeared for some 20 years. N., far from being a man of remote academic interests, had a very practical mind. In his boyhood he made mechanical toys, clocks, and sundials. His interest in chem. began when he was boarding at the house of the apothecary, Clark, during his schooldays in Grantham, and this interest continued after he went to Cambridge. He took his chem. from Baptist van Helmont (q.v.), who discovered the materiality of gases, and from Boyle. The views in the *Principia* are akin to those of Boyle, Hooke, and Mayow on the existence of a vital constituent in the atmosphere, isolated by Priestley long afterwards and named oxygen by Lavoisier. In 1692 he drew up a paper, entitled *De natura acidorum*, dealing with chemical affinity (pub. 1710), but it was in the queries appended to his *Optics* that he approached this problem more closely. Though he achieved the unique triumph of formulating the mathematical law of gravitational attraction, he was not able to extort from nature the laws of chemical action or to reach any corresponding simple numerical relationship. Yet it seems that here was the great object of N.'s chemical speculations and researches and that 'here in the microcosm of chemistry he sought to parallel his discoveries in the macrocosm of mechanics' (Douglas McKie). N. was welcomed at the court of George I and held in increasing reverence and honour—though his mind shrank from contact with worldly society. He d. at Kensington and was buried in Westminster Abbey near the entrance to the choir. Among Eng. scientists he stands foremost, and he left such a mark upon science that, until the beginning of the 20th cent., what was done in celestial mechanics and in general investigations of the properties of matter followed the lines he laid down. See S. Horsley, *Isaac Newtoni Opera quae exstant Omnia*, 1779; Sir D. Brewster, *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, 1855; G. J. Gray, *Bibliography of Sir Isaac Newton*, 1907; L. T. More, *Isaac Newton*, 1934; E. N. da C. Andrade, *Sir Isaac Newton*, 1954. In 1942 (centenary of his birth) the Royal Society (of which N. was president for 25 years), with the financial help of the Pilgrim Trust, acquired N.'s bp. at Woolsthorpe-by-Colsterworth for the nation. The room in which N. was b. has a simple

marble tablet on the wall, inscribed with Pope's well-known couplet,

'Nature and Nature's laws lay hid in night:  
God said, *Let Newton be!* and all was light.'

See the essays by E. N. da C. Andrade and others in the Royal Society pub. *Newton Tercentenary Celebrations*, 1947.

**Newton, John** (1725–1807), clergyman and hymn-writer, b. London. First a sailor and slave-trader, from 1755 to 1760 he was tide surveyor at Liverpool. In 1758 the Archbishop of York refused him ordination, but in 1764 he was ordained by the Bishop of London; he was curate of Olney till 1780, when he became rector of St Mary Woolnoth, Lombard Street, London. He formed an intimate friendship with Cowper (q.v.) and together they produced the *Olney Hymns* in 1779. See J. Bull, *John Newton: an Autobiography and Narrative*, 1868, and *John Newton: Centenary Memorials*, ed. by J. Callis, 1908. There is also a contemporary life by R. Cecil, dated 1808, which was prefixed to a collected ed. of N.'s works, 1816.

**Newton, Thomas** (1704–82), bishop of Bristol, b. Lichfield. He was ordained in 1730. After holding various minor appointments he became Bishop of Bristol in 1761. He ed. *Milton's Paradise Lost*, 1749, and pub. *Dissertations on the Prophecies*, 1754, 1758.

**Newton:** 1. Tn of Scotland, see CAM-BUSLANG.

2. City of Massachusetts, U.S.A., in Middlesex co., on the Charles R., 10 m. W. of Boston, and a residential suburb of that city. There are foundries and machine factories, and manufs. of electrical apparatus. Pop. 81,994.

**Newton Abbot**, mrkt tn of Devon, England, on the estuary of the R. Teign, 16 m. SW. of Exeter. There are large engine works here. Pipeclay and fine china clay are obtained in the neighbourhood. William of Orange was proclaimed King of England here in 1688, at the market cross. Bradley Manor, W. of the tn, is an admirable specimen of 15th-cent. architecture. Pop. 17,000.

**Newton Grange**, vil. of Midlothian, Scotland, 2 m. S. of Dalkeith, with coal-mines, brick and tile works, and paper-mills. Pop. 6000.

**Newton Heath**, see MANCHESTER.  
**Newton-le-Willows**, urb. dist. and tn of Lancs, England, 15 m. both from Manchester in the E. and Liverpool in the W., known until 1938 as Newton-in-Makerfield. The W. part of the dist., known as Earlestown, has the chief wagon repair shops of the Brit. railways, biscuit machinery works and a sugar refinery, and clothing manufs. In the E. part of the tn are railway locomotive and general engineering works, printing and calico printing works. Pop. 21,950 (1951).

**Newton Stewart**, burgh and mrkt tn of Wigtownshire, Scotland, on the R. Cree, 6½ m. NNW. of Wigtown. Cattle markets and horse fairs are held. Pop. 2060.

**Newton-upon-Ayr**, suburb of Ayr (q.v.).

**Newton's Rings.** Set of concentric, circular interference fringes formed around

the point of contact of a convex lens resting on a plane polished surface. Newton took 2 lenses of very slight curvature and pressed them together to form a wedge of air, thinnest near the point of contact and thickening gradually outwards. On pressing, a number of concentric coloured rings could be seen when the eye was focused on the air wedge. They varied in colour and arrangement, but all exhibited colours of the spectrum, and the area at the point of contact appeared black. When the light is transmitted instead of reflected, the colours are complementary and the central spot becomes white. The thickness of the air wedge varies as the square of the distance from the centre. The light is reflected from each surface and arrives at the eye after having traversed paths differing minutely in length. The rays reflected from the 2 surfaces of the air wedge are thus seen simultaneously with a difference of phase which depends on the thickness of air, and on a reversal of phase which takes place on reflection at the air-glass surface. If the total difference of phase is equivalent to a whole number of wavelengths the rays reinforce each other and produce brightness. The circular symmetry leads to the observation of a bright ring. Near by, the thickness of the air wedge leads to 2 rays of opposite phase, and destructive interference takes place with the formation of a dark ring. If  $R$  is the radius of curvature of a convex lens resting on a plane surface, the relation between the wavelength of the light ( $\lambda$ ) and the radius ( $a_n$ ) of the  $n$ th dark ring is  $\lambda = a_n^2/nR$ .

**Newtown:** 1. Manufacturing and co. tn of N. Wales, in the co. of Montgomery, 8 m. SW. of the tn of that name on the r. b. of the Severn, and on the Montgomery Canal, which connects it with the inland navigation of the country. It is the centre of the flannel manufs. of the co. Pop., with Llanllwchaearn, 5540.

2. Suburb of Hobart (q.v.), Tasmania. **Newtown Stewart,** mkt tn of co. Tyrone, N. Ireland, on the Mourne, 10 m. S. of Omagh, a well-known angling centre. Pop. 300.

**Newtownards,** tn of co. Down, N. Ireland, near the head of Strangford Lough. Embroidered muslin, gingham, linen goods, hosiery, and handkerchiefs are manuf. In the neighbourhood are the ruins of Movilla Abbey. Pop. 12,500.

**Newtownbutler,** vil. of co. Fermanagh, N. Ireland, in the rural dist. of Lisnaskea (q.v.).

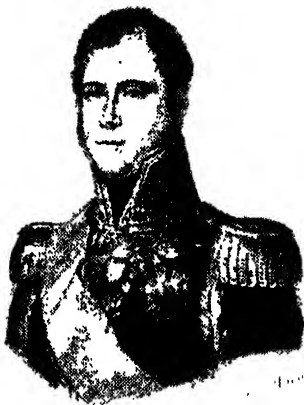
**Newtownhamilton,** mkt tn of co. Armagh, N. Ireland, 11 m. W. of Newry. Pop. 750.

**Nexo, Martin Andersen** (1869-1954), Dan. novelist, b. in the slums of Copenhagen. After a variety of occupations ranging from bricklaying to teaching, he devoted himself to literature. He spent some time in Germany and Russia, and finally became a Communist, convinced of the goodness of the primitive man. His fame rests on his 2 great novel cycles *Pelle Erobreren* (4 vols.), 1906-10, a picture of the working class at the turn of the

cent., and *Ditte Menneskebarn* (5 vols.), 1917-21, the life-story of a proletarian girl. Both have been trans. into many languages, as also his very interesting memoirs. See W. A. Berendsohn, *M. A. Nexo*, 1948.

**Next Friend**, in law, a phrase used to denote the person who in any transaction acts on behalf of another, where that other, whether from youth, mental infirmity, coverture (q.v.), or from some other cause entailing legal incapacity, cannot act for himself (see also CAPACITY; INFANT; MAJORITY). The N. F. of an infant or minor is not necessarily his parent or legal guardian, for the court will in its discretion allow anyone to represent an infant in an action.

**Next-of-Kin**, see KIN, NEXT OF, and DISTRIBUTION, STATUTES OF.



MARSHAL NEY

**Ney, Michel** (1769-1815), marshal of the first Fr. Empire, b. Saarlouis, the son of a cooper. He was a non-commissioned officer in a hussar regiment when the revolution began, and soon became famous for his personal courage. For the capture of Mannheim he was made a general of div. in 1799. After the peace of Lunéville, Bonaparte, anxious to win N. to his party, brought about his marriage with a young aristocratic friend of Hortense Beauharnais, and appointed him inspector-general of cavalry. On the estab. of the empire he was made a marshal. In 1805 he stormed the entrenchment of Elchingen, and was created Duke of Elchingen. He afterwards rendered important services in the Tirol; contributed much to the Fr. successes of 1806 and 1807; and served in Spain with great ability in 1808 and 1809, but quarrelled violently with Masséna, his superior officer in the invasion of Portugal of 1810-11. His relations with his fellow officers were generally difficult,

but his popularity with the ordinary soldiers was enormous. In 1812 he received the command of the third *corps d'armée*, and greatly distinguished himself at Smolensk and the Moskwa, in consequence of which he was created Prince of the Moskwa. It was largely due to his devotion in command of the rearguard that some remnants were saved in the 1812 retreat. He had a prin. part in the campaigns of 1813 and 1814, and subsequently went over to the Bourbons. On Napoleon's return from Elba, N. was sent against Napoleon at the head of 4000 men, but went over to his side. He commanded at Quatre-bras, and in the battle of Waterloo commanded the centre, and had 5 horses shot under him. After the capitulation of Paris he tried to escape to Switzerland; but was arrested, condemned to death for high treason, and shot. N. was fundamentally a simple soldier, at his best in the height of battle, or in moments of military crisis (as in 1812), when his great bravery acted as an inspiration to all around him: he was, however, a quarrelsome officer, and an indifferent strategist. His 'double desertion' (1814-15) was possibly the result of mental panic, and was unpremeditated and unacted by personal ambition. His sons pub. his *Mémoires*, 1833. See lives by H. Welschinger, 1893; L. Blythe, 1937; P. Compton, 1937; also H. Bonnal, *La Vie militaire du maréchal Ney*, 1910-14.

**Nez Percés** (so called from their custom of wearing nose rings), tribe of N. Amer. Indians. After the N. P. war with the whites in 1877 the survivors were sent to Oklahoma, but have now been transferred to Idaho. There are now about 1500.

**Nezametnyy**, see ALDAN.

**Ngami Lake**, former lake of Bechuana-land. It was discovered by David Livingstone in 1849. It was 70 m. in length, with a breadth of 20 m., but now it is only a swamp.

**Ngo Dinh Diem**, President of the Rep. of Viet Nam (see VIET NAM, and VIET NAM, REPUBLIC OF). Son of a prominent Vietnamese Rom. Catholic family in Hue (q.v.), Ngo Dinh Diem entered the mandarin and in 1933 was appointed chief minister when only 32. An uncompromising nationalist, he resigned his high office when France refused to make any concessions to Vietnamese independence. Captured by the Viet Minh (q.v.) in 1946, he was offered a post in their Communist gov., which he refused. He went into exile in 1950, first to Japan and later to the U.S.A. He returned, at the invitation of Bao Dai (q.v.), to become prime minister in 1954, but has since deposed Bao Dai after holding a plebiscite, and has created the Rep. of Viet Nam of which he is president.

**Ngolo-Setas**, people of SE. Chinghai. The N.-S. ter. includes the drainage area of the Upper Tong R. The ter. lies between 2 mt systems, the extreme of the E. end of the Bayen-Khara Mts on the NW., and the complex formed by the chain which extends from the Tao Fu Mts to Mynia Gonka, and by the Szechwan Alps, on the E. and SE. It is a plateau whose

highest level is 16,000 ft; in addition there are wide, deep valleys. The herds-men of the former and the settlers of the latter communicate by means of the secondary valleys of the trib. streams, each being the economic supplement of the other, trade being controlled by the monasteries. The collection of nomads in NE. Tibet is a loosely organised confederation of tribes, the Ngolos and Setas being the most important. Their independence of the Chinese authority in Szechwan prov., and of the temporal power of Lhasa, explains the superficial cohesion of the ensemble, and the slight knowledge which the outside world has of them. It would appear that the Setas are but a tribe of the Ngolos, and the relationship of the two is close enough to justify the hyphenated name. The nomads of the plateau, the N.-S. proper, have the social conditions of all pastoral peoples, in which most of the work is done by the women. The duty of the adult males is to protect the camp, which leaves them enough time and energy for raiding. Sometimes expeditions are directed against the valley peoples, but the usual target is the caravans of strangers; the salt caravans from the Koko-bor are seemingly immune. The strong influence of the magical superstition of Lamaism tends to provoke battle and bloodshed on the plateau. The N.-S. warriors have long hair falling to the shoulders, wear ear-rings of silver, and dress in sheepskins with the wool inside. Apart from their different modes of life, it is probable that anthropological research would reveal important morphological differences between the inhab. of the plateaux and those of the valleys. The N.-S. were first mentioned by Père Hue, and descriptions may be found in his *Souvenirs d'un voyage dans le Tartarie, le Thibet et la Chine pendant les années 1844-6, 1850*. See also A. Guibaut, *Tibetan Venture*, 1947.

**Nguni**, name given to many Bantu-speaking tribes of S. Africa. The N. tribes once lived in what is now Natal, but dispersed about the time of the rise to power of Chaka, King of the Zulu, and of Sobhuza I, King of the Swazi, in the first decades of the 19th cent. To-day the main N. tribes are the Zulu, Swazi, Basuto, and the Cape N. (Pondo, Xosa, etc.) of SE. Africa; the Ndebele (Matabele) of S. Rhodesia and the Transvaal; and the N. of Nyasaland and Tanganyika. These latter groups emigrated from S. Africa, conquering other tribes as they went and forming their own empires. They are often, incorrectly, called 'Kaffirs.' See J. A. Barnes, *Politics in a Changing Society*, 1954, and I. Schapera, *Government and Politics in Tribal Societies*, 1956. See also under tribal names.

**Nguyen Du** (1765-1820), Vietnamese poet who composed the *Kim Van Kieu* (q.v.) during the reign of the Emperor Gia Long (see VIET NAM). B. of a prominent family, Nguyen Du won early fame as a poet and scholar. He became a high mandarin in the Ministry of Rites and travelled on embassies to China. His masterpiece, the *Kim Van Kieu*, won immediate acclaim at court and among



scholars, and its popularity has never waned in Viet Nam since that time.

**Nhe-trang**, tn of S. Annam (q.v.), standing on r. b. of R. Cai at its mouth, 255 m. N.E. of Saigon (q.v.). N. possesses an excellent bathing beach, and is a popular holiday resort with sev. hotels. On the opposite bank of the riv. stands the group of Cham shrines known as Po-nagar (Lady of the City), dating from the 7th to the 12th cents. AD. These are remarkable both for their architecture and their excellent state of preservation.



Photo: N. J. van Warmelo (from *'The Bantu-Speaking Tribes of South Africa,'* edited by I. Schapera

#### KWENA MAN, NGUNI TRIBE

**Niagara** (formerly Newark), tn and summer resort of Ontario, Canada, in Lincoln co., on Lake Ontario, at the mouth of the N. R., 15 m. from the falls. Pop. 2108.

**Niagara Falls:** 1. On lower Niagara R., which is 20 m. in length, and connects Lake Erie with Lake Ontario. The falls are the greatest in the world in volume of water. At Goat Is. the riv. divides. There are 2 distinct falls, side by side: the Amer. Fall, a sheer descent of 167 ft, and 1060 ft wide; and the Horse-shoe Fall, on the Canadian side. The volume of water of this fall is terrific, and a depth of 158 ft is taken in a leap; the spray is like heavy rain. It has been estimated that the water is at least 20 ft in thickness. The fall is over a grand curve of rock measuring 3010 ft. The whirlpool is just below the falls, a raging mass of turbulent water. The riv., now a quiet, gently flowing stream, enters the lake of Ontario at Lewiston. The drop between Lakes

Erie and Ontario is 326 ft. The edge of the Horse-shoe Fall has been receding to the extent of 5 ft each year, but the erection of remedial works is checking further erosion. It is believed that the original falls were at Lewiston. The Gov. Reservations, on both sides of the falls, have been turned into fine parks. One of the best points of view of the fine Horse-shoe Falls is from the railway track, and observation cars are run, and the trains are stopped for some minutes for the benefit of tourists. The falls were discovered in 1678 by a Fr. priest, but his description was laughed at as a traveller's tale. For over half a century the water has been used for industrial purposes, many manufacturing plants being worked by its power. The largest of the plants constructed is the Queenston-Chippawa development on the Niagara R. Construction was begun in 1917 and the first unit was in commercial operation in 1922. Many thousands of tourists visit the falls every summer. The sight is even more wonderful in winter, when the gigantic falls are in the grip of frost and snow, and huge icicles hang glistening in the sunshine. Three bridges span the riv. The view from the suspension bridge is magnificent, whilst the fine culvert bridge is a triumph of modern engineering. The Rainbow Bridge (replacing a former bridge destroyed by ice-jams) was opened to traffic in 1941. This bridge is 950 ft long and cost about £1,000,000. It is the longest fixed-end steel arch span in the world, was dedicated by King George VI and Queen Elizabeth in June 1939, and has a 10-ft footway which gives wonderful views of the cataracts. See H. Hulbert, *The Niagara Falls*, 1908, and R. L. Way, *Ontario's National Parks*, 1946. (See illustration on p. 226.)

2. City of Ontario (formerly Clifton), Canada, in Welland, on the W. bank of the Niagara R., opposite the N. F. It is connected with N. F., New York, by 3 bridges. There are sev. factories which utilise the water-power from the falls. The total installed capacity of the generating plants on the Canadian side of the riv. is about 2,500,000 h.p. There is a beautiful park along the riv. bank. Pop. 24,667.

3. City of New York state, U.S.A., in Niagara co., on the E. bank of the Niagara R., at the falls, 18 m. NNW. of Buffalo. The Rainbow Bridge (1941) replaces the span destroyed by ice in 1938. The falls supply water-power for the city, which is a shipping centre, with important manufs. of chemicals, paper, abrasives, machinery, aeroplanes, metals and metal products, graphite, grease, and electrical equipment. It is the seat of Niagara Univ. N. F. is the site of the largest electric power plant in the world, and is a summer and winter resort. Pop. 90,872.

**Niaméy**, cap. of the Niger colony, Fr. W. Africa, on the E. bank of the Niger R. Two trans-Saharan motor routes end at N., where there is an airfield. Pop. 10,000.

**Niam-Niam**, see AZANDE.

**Nias**, is. off the W. coast of Sumatra,

Indonesia, with an area of 1500 sq. m. Its surface is mountainous. Rice, coconuts, nutmeg, and sago are grown. Pop. about 187,200.

*Nibelungenlied*, see NIBELUNGS.

*Nibelungs*, Scandinavian race of dwarfs, ruled by Nibelung, King of Nibelheim (land of mists), and owners of a hoard of gold and magic treasures guarded by the dwarf Alberic. The name N. passed to the later owners of the hoard, the supporters of Siegfried, and the Burgundians who stole it from them. They sank it in the Rhine, and the secret of its whereabouts died with them; it is now

he is magically bound in love and marriage to Gudrun. He disguises himself as her brother Gunnar, and passes through the magic fire again to secure Brunhild to be Gunnar's wife, exchanging his Nibelungen ring for hers, which he gives to Gudrun. Later the wives quarrel, and Gudrun shows Brunhild her ring, to prove that Siegfried had tricked her. Brunhild gets the deceiver killed, then slays herself upon his funeral pyre. In the *Nibelungenlied*, Siegfried becomes Siegfried, prince of the Netherlands, who has killed the Nibelungs and stolen their treasure; he seeks at Worms the hand of the Burgundian



National Film Board, Canada

#### THE NIAGARA FALLS, ONTARIO

known only to the Rhine maidens. Wagner's operatic cycle *The Ring of the Nibelungs* is written upon a conflation of the *Nibelungenlied* (surviving in a middle German version), which is a legend about human characters supposed by some to be derived originally from the overthrow of the Burgundian kingdom of Gundarhar by the Huns in 436, with an ancient Teutonic saga telling much the same myth about the gods. In the Icelandic Eddas is recounted the story of how Odin, Loki, and Horner have to pay wergild (q.v.), or compensation, to a giant Rodman for killing his son. Loki forces Andvari, a deity in the form of a pike, to give up his hoard of gold, and his magic ring which breeds gold, and gives these to Rodman. But on them is Andvari's curse which causes the death of Rodman and his 2 sons Fafner and Regin, after the gold has passed to each in turn. Finally the gold passes to Sigurd, son of Sigismund the Volsung. Sigurd finds Brunhild (q.v.) asleep amid the magic fire, frees her, and pledges her his troth. But in Rhineland

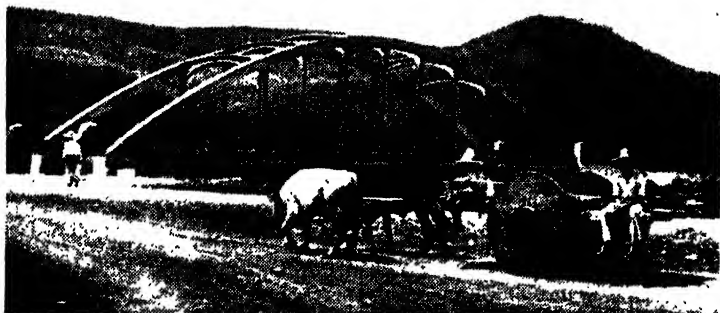
Princess Kriemhild. To obtain her he has to secure Brunhild, Queen of Iceland, for Gunter. Brunhild has a magic ring which gives her superhuman strength, and will only wed one who can carry her off by force. This Siegfried helps Gunter to do, wrestling with her while wearing Alberic's cape of invisibility, but at the same time he steals her talismanic ring. The quarrel between the wives follows, Siegfried is killed, and Kriemhild, in revenge, marries Attila, and lures the Burgundians to their doom in Hungary.

Nicaea (modern Isnik), city of ancient Bithynia, in Asia Minor, on the E. shore of Lake Ascania. It was built by Antigonus, the son of Philip, in 316 BC, and named Antigonea, but the name was changed by Lysimachus to N. in honour of his wife. N. was of great importance under the Rom. and Byzantine emperors, having fine streets and monuments. The sultan Solymen had his cap. here in 1078, and after the Latins conquered Constantinople in 1204 N. was the cap. of an E. empire. It was besieged and taken by

the crusaders during the First Crusade (1096).

In eccles. hist. it is noted as the scene of 2 councils; the first oecumenical council, consisting of 300 bishops and the Emperor Constantine, was held here in AD 325 to discuss, among other things, the Arian question and the Meletian schism, and to fix the date of Easter; the Nicene Creed (q.v.) had its first formulation. The seventh oecumenical council, held here in 787, discussed mainly the question of image worship. See also NICE (for which a former name was N.).

Managua and the N., are situated in Central N. The latter is 100 m. long and has an area of 2900 sq. m. There are 5 rapids on the San Juan R., and they greatly impede navigation. The climate is tropical except on the highlands. Cotton, coffee, rubber, and hides are the chief products; coffee formed 34 and cotton 39 per cent of the 1955 exports. Sugar, timber, maize, rice, bananas, and cocoa are also produced. There are rich, undeveloped resources. Gold is mined on the Caribbean coast. The forests yield mahogany and cedars, and form a valu-



Camera Press

#### THE SEBACO RIVER BRIDGE, NICARAGUA

This was given by the U.S.A. to Nicaragua, and is on the route of the Pan-American highway.

**Nicander, Karl August** (1799-1839), Swedish poet, b. Strengnäs. In 1820 he pub. his first vol. of poems, and his powerful tragedy *Runesvardet* (The Runic Sword). He also wrote *Runeor* (The Runes) and *The Death of Tasso*, for which he was awarded a medal by the Swedish Academy. See G. Lokrantz, K. A. Nicander, 1939.

**Nicaragua**, rep. of Central America, between the Caribbean Sea and the Pacific Ocean. Area 57,143 sq. m.; pop. (1955 estimate) 1,266,429. Along the Caribbean coast there are lagoons, estuaries, and swamp lands, but the Pacific coast is rocky. The prin. ports are Corinto, Puerto Somoza, Puerto Morazán, and San Juan del Sur on the Pacific side, and Bluefields, Puerto Cabezas, and Greytown (San Juan del Norte) on the Caribbean. The Cordillera de los Andes, a volcanic range, crosses the N. half, Cosigüina (2776 ft) and El Viejo (5839 ft) being the highest summits. There are 16 Depts and a National Dist. (cap.). The cap. of the rep. is Managua (q.v.); among other tns are Matagalpa, León, Jinotega, Granada, Masaya, Chinandega, and Bluefields (qq.v.). Two large lakes, the

able part of the exports. There are other excellent timber trees, rosewoods, guaiacum (or lignum vitae), gums, and dye-woods. Rubber is produced. In 1955 the imports were valued at \$9,646,000 Amer. dollars, and exports at \$80,282,000. Exports to the U.K. totalled \$4,928,000, and imports from the U.K. \$2,282,000.

There are 431 km. of railway, a new stretch joining Puerto Morazán and Chinandega. The roads for the most part are mere tracks, and the want of an adequate network has hindered the exploitation of large areas of agric. and forest land. The one important all-weather road is the Inter-Amer. (or Pan-Amer.) highway, which runs for 240 m. from the Costa Rican frontier, through Managua, and north to the Honduran frontier. A concrete highway, 19 m. long, from Las Conchitas is open to Masachapa, on the Pacific. A branch road (240 m.) of the Inter-Amer. highway is being built from San Benito, on the highway, to Rama, 60 m. from Bluefields, on the Atlantic. There are air services to the U.S.A. and the Central and S. Amer. reps. There are 47 national radio stations, and about 100 others. Most of the people are of mixed Indian

and European blood. Primary education is free and compulsory, but the masses are ignorant; illiteracy amounts to about 65 percent. There are 2000 state elementary schools and 42 secondary, but the latter are carried on by private individuals. There are univs. at Managua, León, and Granada. Rubén Darío (q.v.), the greatest of all Sp. Amer. poets, was a native of León. The prevailing religion is Rom. Catholic, and N. constitutes one archbishopric and eccles. prov., the seat of the archbishop being Managua, with bishoprics at León, Bluefields, Granada, and Matagalpa. The gov. consists of a president elected for 6 years, and a Congress composed of 2 houses, the Chamber of Deputies having 42 members, and the Senate 16, all elected for 6 years by popular vote of all males over 21, and those over 18 who can read and write. The present constitution dates from May 1951. The judicial power is vested in the supreme court at Managua, 5 chambers of second instance (León, Granada, Bluefields, Masaya, and Matagalpa), and about 150 judges of inferior tribunals. There is a national guard of 220 officers and 3000 other ranks, and a coastguard service.

*History.* N. was part of the Maya (q.v.) empire until overrun by the Aztecs (q.v.), who, however, made no permanent settlement there. Columbus sighted the E. coast in 1502. The first European to explore the area (1522) was Gil González de Avila, who converted the chief of the leading Indian tribe to Christianity, and with the chief's help the Sp. forces conquered the other tribes, and estab. the area as a prov. of Spain. Gil González's successor, Hernán de Córdoba, founded Granada (q.v.) in 1524. During its hist. as a part of the Sp. dominions N. was administratively a part of Guatemala. During 1822-3 it was part of the Mexican empire; on the fall of that empire in the latter year it joined the Central Amer. Union until 1838, when an independent gov. was estab. N. was separated from Spain in 1865, and its subsequent hist. for many years was a troubled one. There was friction with Britain over the Mosquito Coast, the name by which its E. coastlands were known (see CLAYTON-BULWER TREATY and MOSQUITOS), and disputes with Guatemala and Costa Rica.

In 1909 a revolution broke out against the gov. of President Zelaya, and 2 Americans who joined the insurgents were shot on Zelaya's orders. The U.S.A. sent warships and broke off diplomatic relations. In 1912, at the invitation of President Adolfo Díaz, Amer. forces were stationed in N. In spite of revolutionary outbreaks at various times, the presence of Amer. forces undoubtedly helped the country towards internal peace and prosperity. On the withdrawal of the forces in 1925 revolution broke out again, and the insurgent general became president in 1928. Faction fights continued; the Amer. president (Coolidge) sent out a representative who, with U.S. marines, supervised the elections of 1928, 1930, and 1932, and a quieter political atmosphere has since prevailed. The U.S.A.

acquired naval bases, and the option for a canal route (see next article). There are also plans to canalise the R. San Juan, and thus provide a Caribbean-Pacific link for N. and Costa Rica. N. declared war on the Axis powers in Dec. 1941, attended the San Francisco Conference of 1945, and joined the U.N. See J. Gámez, *History of Nicaragua*, 1889; S. J. Bernado Portas, *Compendio de la historia de Nicaragua*, 1918; C. R. Enock, *The Republics of South and Central America*, 1923; H. L. Stimson, *American Policy in Nicaragua*, 1927; T. Gann, *Discoveries and Adventures in Central America*, 1928; R. do Nogaes, *The Looting of Nicaragua*, 1932; M. Tweedy, *This is Nicaragua*, 1953; International Bank, *Economic Development of Nicaragua*, 1953.

*Nicaragua Canal.* In 1884 a treaty was made between the gov. of U.S.A. and Nicaragua with the object of cutting a ship canal to link up the Atlantic and Pacific oceans. The canal was begun at Greytown in 1889, and its total length would have been about 170 m., including Lake Nicaragua and the San Juan R. Less than 30 m. would have had to be excavated. Operations were, however, suspended in 1893, and attention was directed to the Panama Canal, whose last barrier was blown away by dynamite in Oct. 1913, and the waters of the Pacific mingled with those of the Atlantic. The N. C., though it would have been a longer route, presented fewer difficulties in the way of natural barriers and fewer gigantic rocks to engineer and blast. The scheme was abandoned owing principally to the political unrest of the country. By a treaty in 1916 the U.S. Gov. for 3 million dollars acquired the option for a canal route through Nicaragua and also for naval bases in the Bay of Fonseca on the Pacific coast, and Corn Is. on the Atlantic coast. The treaty was ratified by Nicaragua in 1916 and by the U.S.A. in 1926. In 1931 Amer. military engineers reported to Congress that a Nicaraguan canal would cost fivefold that of a third set of locks on the Panama Canal, but a later estimate was much lower. Inconclusive surveys of the route recommenced in 1939.

*Nicarao*, see NIKIRAN.

*Nicastro*, It. tn in Calabria (q.v.), 18 m. WNW. of Catanzaro (q.v.). It has a cathedral, and a ruined castle in which the Emperor Frederick II (q.v.) was confined. There is a trade in agric. produce. Pop. 30,200.

*Niccolini, Giovanni Battista* (1782-1861), It. poet and dramatist, b. near Pisa. N.'s first poem, *La Pietà*, 1804, was influenced by Foscolo. From 1807 to 1808 he was prof. of hist. and mythology at the Florentine Academy of Fine Arts. His first dramatic work was the tragedy of *Polissena*, 1810, followed by *Ino e Temisto*, 1825, *Edipo*, and *Medea*, 1825. The first of his political dramas, *Nabucco*, appeared in 1815; another invective against absolute power is *Antonio Foscari*, 1827. *Arnoldo da Brescia*, 1843, is generally considered his masterpiece (Eng. trans. by T. Garrow, 1846). His pub. and unpub.

works were ed. by Gargioli, 1863-80. See R. Guastalla, *La vita e le opere di G. B. Niccolini*, 1917.

**Niccolò Alunno** (c. 1430-1502), see FOLIGNO, NICCOLÒ DA.

**Niccolò Pisano**, see PISANO.

**Nice** (It. *Nizza*; auct. *Nicaea*), Fr. city, cap. of the dept. of Alpes-Maritimes, at the mouth of the R. Paillon on the Baie des Anges, near the It. frontier, 420 m. S.E. of Paris. It is one of the leading resorts of the Riviera (q.v.). The city was probably founded by Phocaeans from Massalia (see MARSEILLES). The coast was occupied by the Romans in 154 BC, who estab. the settlement of Cemenelum (Cimiez, q.v.) 2 m. inland. In the 3rd cent. AD a bishopric was founded at N. The co. of N. shared the hist. of Provence (q.v.) until 1388, in which year it attached itself to Savoy (q.v.). It was ceded to France by Sardinia in 1796, was restored to Sardinia in 1814, and was again ceded to France after a plebiscite in 1860. The city is finely situated in a small coastal plain, sheltered on the N. by an arc of hills on which are numerous villas. In the centre of the tn is a hill, 'c Châteaueu,' where the original settlement stood, and which has the remains of a citadel (destroyed by the Duke of Berwick in 1706) and of a Romanesque cathedral. Along the shore, and around the base of the hill, stretch fine promenades, of which the most celebrated is the *Promenade des Anglais*. At the E. end of the *Promenade des Anglais* is the garden of Albert I and the *Place Masséna*, which is the centre of the city. There are sev. churches of note, including the cathedral of Ste-Réparate (1650). The Musée Masséna and the Musée Jules Chéret contain fine collections of tapestries, pictures, jewels, and arms. Many carnivals and fêtes are held in the city; the Mardi Gras at N. marks the height of the Riviera festivals. Scents, olive-oil, soaps, liqueurs, and textiles are manuf., and there is a trade in fruit, flowers, and essences. Masséna and Garibaldi (qq.v.) were natives. Pop. 244,400. See E. Berli, *Le Port franc de Nice*, 1924, and M. Malingue, *Les Primitifs nicois*, 1941.

**Nicene Creed**, the only creed of the Church which has received oecumenical sanction, was originally drawn up at the Council of Nicaea in AD 325. It was in the form familiar to Westerns in the Rom. mass and the Anglican communion service, but terminated at the words 'And I believe in the Holy Ghost.' It was reaffirmed at the Council of Constantinople (381), and the rest of the creed, as we have it, was then added, with the exception of the word *filioque* (q.v.) ('and the Son'). See also ARIUS and CREED.

**Nicephorus**, St (c. 758-829), patriarch of Constantinople (806), defended the use and veneration of images against the Iconoclasts (q.v.), and was banished to a convent in Asia by Leo the Armenian (816). He wrote *Chronographia Brevis* and *Breviarium Historicum*, with other historical works.

**Nicephorus**, name of 3 Byzantine emperors:

**Nicephorus I** was emperor from 802 to

811. He made a treaty with Charlemagne, but in a war with the Saracens and Bulgarians was surprised and killed.

**Nicephorus II** was emperor from 963 to 969. In a series of campaigns against the Saracens (960-3) he captured Candia and Aleppo. He was assassinated by his wife and nephew.

**Nicephorus III (Botaniates)**, last of the Armenian dynasty, was emperor from 1078 to 1081. During his reign the Seljuks advanced into Asia Minor and Norman power in Italy increased. His general, Alexius Comnenus, finally deposed him, and he retired to a monastery.

**Nichol**, John (1833-94), scholar and author, b. Montrose. He was educ. at Glasgow Univ. and Balliol College, Oxford, where he was president of the Old Mortality Club, to which belonged T. H. Green the philosopher, Bryce the historian, and the poet Swinburne. From 1862 to 1889 he was the first prof. of Eng. literature at Glasgow. Among his works are *Hannibal*, 1873, a drama; *The Death of Themistocles and other Poems*, 1881; *Fragments of Criticism*; and a hist. of Amer. literature, 1882. He also wrote lives of Byron, 1881, Burns, 1882, and Carlyle, 1892. See life by W. A. Knight, 1896.

**Nicholas**, St (d. c. 350), Bishop of Myra in Lycia and patron saint of Russia. He is specially honoured as the guardian and patron of children and of scholars, as also of travellers by sea and land, and merchants. He is a prominent saint of the Gk Church, and there are many legends illustrating his benevolence. His memory still survives in the Santa Claus of Christmas rejoicings. His festival is on 6 Dec. See E. Crozier, *The Life and Legends of St Nicholas*, 1949.

**Nicholas**, name of 5 popes and 1 anti-pope.

**Nicholas I**, St, sometimes called the Great, succeeded Benedict III in 858. His pontificate was marked by 3 great contests: those in connection with the degraded patriarch, Ignatius of Constantinople, the divorce of Lothair, King of Lorraine, and with the right of bishops to appeal to Rome against the verdict of their metropolitan. He d. in 867. See E. Amann, *L'Époque carolingienne*, 1937.

**Nicholas II** (Gerard, a Burgundian) was Pope from 1058 to 1061; he owed his importance to the counsel and influence of Hildebrand, whose policy of reform he pursued. See A. Fliche, *La Réforme grégorienne*, 1924-37.

**Nicholas III** (Giovanni Gaetano Orsini), b. Soriano, was Pope from 1277 to 1280; he strengthened the papal power in Italy and made the Vatican the official residence.

**Nicholas IV** (Girolamo Masci), b. Ascoli, was Pope from 1288 to 1292; a member of the Franciscan order, his main object was the recovery of the Holy Land by crusades. The college of cardinals acquired independence by his financial reforms. See O. Schiff, *Studien zur Geschichte Nikolaus IV.*, 1897.

**Nicholas V** (Tommaso Parentucelli), b. Sarzana, was Pope from 1447 to 1455.

During his pontificate, in 1449, the resignation of the antipope, Felix V, put an end to the papal schism. The fall of Constantinople in 1453 was a great blow to him. He inspired many architectural projects in Rome, and founded the Vatican library.

**Nicholas V** (Pietro Rainalducci) was antipope in Italy from 1328 to 1330 during the pontificate of John XXII at Avignon. He resigned in 1330, having been excommunicated by John in 1329, received pardon for his sins, and was kept in honourable imprisonment in the papal palace until his death in 1333.

**Nicholas I** (1796-1855), Russian emperor, third son of Paul I. Succeeded Alexander I, 1825. His accession was followed by the uprising of the Decembrists (q.v.). He had no aptitude for learning and was badly educ., but was honest and possessed a strong sense of duty. The main events of his reign were the codification of existing laws by Speransky (q.v.), the prohibition of selling serfs separately from their families, and a great improvement in the position of Crown peasants; successful wars with Persia, 1826-8, and Turkey, 1827-9; Polish uprising, 1830-1; and the Crimean War, during which N. died. See C. de Grunwald, *Tsar Nicholas I* (trans.), 1954.



NICHOLAS II

**Nicholas II** (1868-1918), last Russian emperor, first cousin of King George V, son of Alexander III, whom he succeeded in 1894. He had considerable personal charm and natural intelligence, and loved his family and country, but he was reactionary in his outlook and of a weak and irresolute character. In reply to an address on his accession by the Tver' (q.v.) Zemstvo he spoke of 'senseless dreams of the participation of Zemstvo representatives in the affairs of internal administration' and stated his resolve to maintain the principle of autocracy. However, he was forced by the revolution of 1905 (q.v.) to grant a constitution providing for a legislative assembly (see DUMA). The main events of his reign in external affairs were the strengthening of the Franco-Russian alliance, the convening by N. (on the initiative of Witte, q.v.) of The Hague conference in 1898

which set up the International Court of Arbitration, the occupation of Port Arthur in 1896 and of Manchuria in 1900, and the Russo-Jap. war in 1904-5. Soon after the beginning of the First World War N. dismissed his uncle, the Grand Duke Nikolay Nikolayevich (q.v.), and himself became commander-in-chief of the armed forces, leaving the gov. of the country to the empress (see ALEXANDRA FEODOROVNA) and in fact to Rasputin (q.v.). At the beginning of the Feb. revolution (q.v.) in 1917 he immediately followed the advice of the Duma leaders and the military commanders to abdicate. He was at first confined to the palace at Tsarskoye Selo, then banished to Tobolsk in Siberia. After the Bolshevik seizure of power N. was brought to Yekaterinburg and, together with his family, was shot by the Cheka (q.v.) on the decision of the local Soviet (q.v.). See Eng. trans. of the correspondence with his wife, 1929, and Sir B. Pares, *The Fall of the Russian Monarchy*, 1939.

**Nicholas** (Russian, Nikolay Nikolayevich) (1856-1929), Grand Duke, Russian general, cousin of Tsar Nicholas II. In Oct. 1905 he urged Nicholas II to issue a Constitutional Manifesto. After the outbreak of the First World War, as supreme commander-in-chief of the Russian armies, he promised self-gov. to the Poles, thus winning many of them for the allied cause. He showed himself an able and courageous commander, but as a result of court intrigues was dismissed by Nicholas II in Sept. 1915 and appointed Viceroy of the Caucasus and commander-in-chief of the Caucasian army. After the 1917 revolution N. emigrated and was considered candidate to the Russian throne by the non-legitimist monarchists among émigrés.

**Nicholas of Damascus** (fl. 16-8 BC), see DAMASCENUS, NICOLAUS.

**Nicholas of Hereford** (fl. 1390), Lollard preacher and author, was b. probably in Hereford. A close friend and supporter of Wycliffe, he was excommunicated in 1382 for his support of the Lollard doctrines. An appeal to the Pope against his sentence led to his imprisonment in Rome. He escaped, but was captured in England. In 1391 he recanted, and after holding sev. offices under the crown retired to a monastery. He aided Wycliffe in his trans. of the Bible.

**Nicholas I of Montenegro** (1841-1921), King of Montenegro, b. Njegoš. He was proclaimed prince in 1860. Montenegrin independence was recognised in 1878, and in 1900 N. took the title of royal highness. Ten years later he styled himself king. N. joined in the First World War on the side of Serbia, but by 20 Jan. 1916 he had capitulated, proclaiming that unconditional surrender was necessary to avert the ruin of his country. N. retired to France, where he d. The Montenegrin Grand Assembly in April 1919 affirmed his dethronement and that of his dynasty, and proclaimed the union of Montenegro with the kingdom of the Serbs, Croats, and Slovenes.

**Nichols, Anne**, Amer. actress and playwright. She was famous for her play

*Abie's Irish Rose*, which ran continuously in New York from 1922 to 1927 for a total of 2327 performances, the longest run up to that time in the hist. of the Amer. theatre. It has since been surpassed only by Erskine Caldwell's *Tobacco Road*, with 3182 performances, and Lindsay and Crouse's *Life with Father*, with 3224. Miss N. also wrote *The Gilded Cage*, 1920, *Love Dreams*, 1921, and (with Adelaide Matthews) *Just Married*, 1921.

Nichols, John (1745-1826), historian and biographer, b. Islington. When 13 he was placed with Wm Bowyer, the printer, to whose business he succeeded in 1777. He pub. in 1778 *Anecdotes, Biographical and Literary of William Bowyer, Printer*. Other works of which he was either editor or author are *The Progresses and Public Processions of Queen Elizabeth*, 1788, and *Illustrations of the Manners and Expenses of Ancient Times in England*, 1791. He owned the *Gentleman's Magazine* from 1792 till his death. He was succeeded by his son, John Bowyer Nichols (1779-1863), who also pub. sev. hist., and was a fellow of the Society of Antiquaries, and of the Linnean Society. See J. Nichols, *Brief Memoirs of John Nichols*, 1804.

Nichols, John Beverley (1898- ), author and journalist, b. Bristol. He was educ. at Marlborough and Oxford, where he ed. the undergraduate magazine *Isis*, founded and ed. the *Oxford Outlook*, was president of the Union, and pub. his first novel. Taking up journalism, he estab. a reputation as a brilliant and unorthodox interviewer with his books *Are They the Same at Home?*, 1927, *The Star Spangled Manner*, 1928, and *Oxford-London-Hollywood*, 1931. Later he settled in Hunts, where he wrote *Down the Garden Path*, 1932. Others of his books are *For Adults Only*, 1932, *Cry Havoc*, 1933, *The Fool Hath Said*, 1936, *News of England*, 1938, and his autobiography, *Twenty-Five*, 1926, later continued in *All I Could Never Be*, 1949, and *The Sweet and Twenties*, 1958. He also wrote a number of plays, and a weekly column which was for long a popular feature of the *Sunday Chronicle*.

Nichols, Robert Malise Bowyer (1893-1944), poet, b. Shanklin, Isle of Wight. He was educ. at Winchester and Trinity College, Oxford. At the beginning of the First World War he obtained a commission in the Royal Field Artillery, and while serving in France pub. *Invocation*, a book of war poems. In 1917 his second book, *Ardours and Endurances*, was very successful. *Aurelia*, 1920, contains the finest of his poems. His later works, such as the drama *Guilty Souls*, written while he held the Lafcadio Hearn chair of Eng. literature in the Imperial Univ. of Tokyo, tend to be overlong and grandiose. His only publicly performed drama, *Wings over Europe* (in co-operation with Maurice Browne), produced in London and New York, foresaw the problems of the Atomic Age. In 1934, *Fiebo*, a long satire, was the last of his poetry, save for a few pieces in 1942, in *Such was my Singing*.

Nicholson, John (1821-57), general, b. Ireland. In 1841 he assisted in the

defence of Ghazni, and greatly distinguished himself, but was ultimately captured and imprisoned at Kabul. He was rescued by Gen. Pollock after some months' incarceration. He saw active service during the second Sikh war. After the annexation of the Punjab he served in the Punjab Commission. At the outbreak of the mutiny N. was brigadier-general. On 14 Sept. 1857 he commanded the main storming party in the assault on Delhi, but was mortally wounded. See lives by J. L. Trotter, 1904, and H. Pearson, 1939.

Nicholson, Norman Cornthwaite (1914- ), poet, b. Millom, Cumberland. In 1944 he pub. his first book of verse, *Fire River*, and in 1948 *Rock Face*. His play, *The Old Man of the Mountains*, 1945, tells the story of Elijah and the ravens. He also wrote a guide to Cumberland, and ed. a selection of Wordsworth's poems.

Nicholson, William (1753-1815), scientist, specialised in physics and chem., b. London. He turned to scientific research after a commercial career with the E. India Co., and made the historic discovery that water could be decomposed by passing an electric current through it. This is an example of electrolysis which is the foundation of many important industrial and scientific operations. Working in company with another Eng. chemist, Carlisle, in 1800, N. constructed an electric battery (known at that time as a 'voltaic pile') from 36 half-crowns and a number of zinc disks and pieces of pasteboard. Though the current produced by this crude apparatus was so minute that only a few thumbfuls of gas were collected over a period of 13 hrs, N. showed not only that water could be electrolysed, but that the 2 gases of which it is composed appear at different places, the oxygen being evolved where the electric current enters the water and hydrogen where it leaves. N. made many other scientific discoveries after his return from India in 1786. He invented a hydrometer, took out patents for textile printing machinery, planned and carried out a scheme for the water supply to Portsmouth. He was a scientific writer of great contemporary eminence and founded and, until his death, ed. the *Journal of Natural Philosophy*.

Nicholson, William (c. 1782-1849), the 'bard of Galloway,' b. near Borgue, Kirkcubrightshire. He became a pedlar and wrote verses on his wanderings. The preface to his *Tales in Verse and Miscellaneous Poems, descriptive of Rural Life and Manners*, 1814, acknowledges his indebtedness to Hogg. His best poem is 'The Brownie of Blednock,' a folk-lore ballad.

Nicholson, Sir William Newzam Prior (1872-1949), painter and designer, b. Newark-on-Trent, was educ. at the Magnus School there, and trained under Wm Cubley of Newark, a pupil of Sir Wm Beechey, R.A., and in Paris. He collaborated with his brother-in-law, James Pryde (q.v.) in producing the 'Beggars' posters, which owed their inspiration to Whistler and Toulouse-Lautrec and were noted for their effective

simplicity. N. next produced woodcuts in colour, which were pub. in collections under the titles *London Types*, *Characters of Romance*, *Twelve Portraits*, etc. Unlike many W. woodcutters, N.'s work is completely free from the influence of Jap. colour-prints. His first appearance as a painter in oils was in exhibitions of the International Society (of which Whistler was president). He never exhibited in the Royal Academy, but one-man shows of his work were held at the Leicester and the Beaux Arts Galleries, London. In 1933 an exhibition of his work was held in Nottingham in recognition of his birth in that co. The Tate Gallery has 2 of his best portraits: 'Portrait of W. E. Henley,' bequeathed by Mrs W. E. Henley (1925), and 'Portrait of Miss Jekyll,' presented by Lutyens (1922); also 'Lady in Furs' and a still-life study, 'The Lowestoft Bowl.' He is well represented in British municipal galleries, e.g. 'The Landlord' in the Manchester City Art Gallery, and other works in the galleries of Liverpool and Nottingham. In the Fitzwilliam Museum are his portraits of Gen. Smuts and of A. C. Benson; and his 'Portrait Group of Mr and Mrs Sidney Webb,' 1929 (London School of Economics), is an outstanding conversation piece. He excelled in still-life, and also designed costumes and settings for the stage, e.g. the costumes in *Peter Pan* and the settings and costumes for Massine's ballet *The Rake*. See life by Marguerite Stein, 1943.

**Nicias**, Gk painter, son of Nicomedes b. Athens, and fl. probably between 350 and 300 bc. According to Pliny, he was employed by Praxiteles to colour marble statues.

**Nicias** (c. 470–414 bc), Athenian statesman and general, belonging to the aristocratic party. He was sev. times a colleague of Pericles in the strategia, and on the death of the latter became leader of the aristocrats, and opposed Cleon. Prior to the Sicilian expedition he achieved a number of minor successes, and in 421 took a prominent part in the peace of N., which terminated the first part of the Peloponnesian war. In 415 he was one of the commanders in the naval expedition against Sicily, and after the flight of Alcibiades was practically the sole commander. In 414 bc he led the great expedition to Syracuse; but the enterprise terminated in disaster, and he was put to death by the Syracusans. See Plutarch's *Nicias* and Thucydides vii.

**Nickel**, one of the transitional elements of the first long period of the periodic table. The primary physical constants are electron configuration, 2, 8, 16, 2, i.e. atomic number 28; atomic weight 58.69; density 8.9; melting point 1452°C.; electrical conductivity 12.9 (silver = 100); thermal conductivity 0.14 cal./cm.<sup>2</sup>/cm./°C./sec.; crystal structure: α-nickel, hexagonal close-packed; β-nickel, face-centred cubic; symbol Ni.

The name N. is derived from the term 'kupfer-nickel' applied derisively by the old Westphalian miners to an ore resembling copper, actually N. arsenide, from

which no copper could be extracted and was therefore believed to be 'bedevilled.' In 1751 Cronstedt obtained impure malleable N. from this ore. The 2 most important sources are New Caledonia in the S. Pacific, and near Sudbury in Ontario. The New Caledonian ore is garnierite, (MgNi)OSiO<sub>3</sub>·H<sub>2</sub>O, containing up to 35 per cent of N. but averaging about 6 to 7 per cent; 6000 short tons were produced in 1937. The Sudbury ore is pentlandite, (FeNi)S to NiS·2FeS, averaging 2 to 3 per cent; 102,000 short tons were produced in 1937. The method of extracting the N. from the ore depends upon the type of ore. The Sudbury ore, being associated with copper, is smelted to a copper-N. matte from which the N. is extracted by the Orford 'tops and bottoms' process of the International N. Co., and may be refined by the Mond carbonyl process or by electro-deposition. The New Caledonian ore is simpler to deal with since no separation from copper is necessary, but iron has to be removed by conversion before the matte is roasted to oxide which is reduced to metal by coal.

Details of the processes are as follows: The Canadian ore analyses at copper, 1–2 per cent; N., 3–4 per cent; iron, 40 per cent; silicon, 25 per cent; sulphur, 20 per cent; alumina, etc., 10 per cent. The stages of extraction are: (i) By differential froth flotation it is possible to obtain 2 concentrates. The first to rise to the surface is mainly copper and is treated for extraction of this. After adjustment of the conditions most of the N. plus the remaining copper comes up. (ii) The copper-N. concentrate is roasted in a multi-hearth MacDougall furnace, the reaction being self-supporting, which reduces the sulphur content from 28 per cent to 16 per cent. (iii) Smelting in a reverberatory furnace follows; the product is copper-N.-iron matte, containing 25 per cent N., on which the gangue floats and can be tapped off. (iv) The matte is converted to oxidise the iron and flux it off as a ferro-silicate slag. The blow is not continued any longer than is required to remove the iron, because over-conversion would oxidise the N. sulphide to oxide which would be lost in the slag. The resulting matte, containing 80 per cent N., together with copper, is the raw material of the Orford process, which is based on the fact that if mixed copper and N. sulphides are fused with sodium sulphide the mass separates, on solidification, into 2 layers, the 'bottoms' being mainly N. sulphide and the 'tops' a mixture of sodium and copper sulphides. The reaction takes place in a blast furnace in the presence of coke, the product being allowed to separate in 6-ton pots. The 'bottoms' are ground, washed, and sintered to oxide: 2NiS + 3O<sub>2</sub> → 2NiO + 2SO<sub>2</sub>. The oxide is reduced to metallic N. by coal in a reverberatory furnace: 2NiO + C → 2Ni + CO<sub>2</sub>. In the Mond refining process, originated by Mond, Lager, and Herz, and used by the International N. Co. near Swansea, the Orford 'bottoms' are crushed, ground, washed, and roasted at 700° C. to produce N. oxide.



This is reduced to metal by heating it at 350–400° C. in an atmosphere of water-gas; 97 per cent of the reduction is done by the hydrogen and only 3 per cent by the carbon monoxide:  $\text{NiO} + \text{H}_2 \rightarrow \text{Ni} + \text{H}_2\text{O}$ . Next carbon monoxide is passed over the N. and forms volatile N. carbonyl:  $\text{Ni} + 4\text{CO} \rightarrow \text{Ni}(\text{CO})_4$ . The temp. is 60° C., maintained by the exothermic nature of the reaction. Finally the carbonyl is decomposed by passing it over N. pellets at 180° C., the newly formed N. deposits on the pellets releasing carbon monoxide for further use. The product of the Orford process may also be purified by electrolysis a N. sulphate solution containing also sodium sulphate and boric acid. The copper which goes into solution from the impure N. anodes is kept from the cathodes by placing the latter in a canvas compartment and maintaining a head of copper-free solution round them. The copper-contaminated solution is pumped into a separate tank, where copper and iron are precipitated and removed before the solution is recirculated to the cathode compartment.

The New Caledonian garnierite is first smelted with gypsum and coke in a blast furnace, the product being a N.-iron matte containing 30–45 per cent of N. as sulphide. This is treated in a Bessemer converter in which the iron is removed as a silicate slag and the sulphur partially oxidised away. The N. sulphide is roasted to oxide, which in turn is reduced to metal by mixing it with coal and heating in either retorts or reverberatory furnaces.

Pure N. is used as a catalyst, for plating, and for some laboratory apparatus such as crucibles, spatulas, etc., where its resistance to oxidation is useful. N. is ferro-magnetic at room temp. but becomes non-magnetic when heated above 365° C. When N. is alloyed with iron the magnetic change temp. of the resulting solid solution decreases as the percentage of N. increases until at about 30 per cent N. the alloy is non-magnetic at room temp. With further addition of N. the magnetic permeability increases again and reaches a peak at about 78 per cent of N. The alloy of this composition is called permalloy. A similar alloy is mu-metal: 74 per cent N., 20 per cent iron, 5.3 per cent copper, 0.7 per cent manganese. Both are used where high permeability at low field strength is required. The addition of N. to iron also gives rise to a reduction of thermal expansion until at 36 per cent N. the alloy invar is produced which has zero coefficient of expansion. The alloy of 80 per cent N. with 20 per cent chromium is widely used as electrical resistance heating elements in furnaces because of its resistance to scaling at temps. up to 1000° C. A development of this basic composition is nimonic, a standard alloy for the blades and other high temp. parts of the gas turbine where creep resistance at high temps. is required.

All alloys of N. with copper are of the solid solution type, hence they are all particularly amenable to cold-rolling,

-drawing, -forging, etc. Examples include Monel metal, 70 per cent N., 30 per cent copper, with small amounts of iron and manganese, noted for its high resistance to many corrosive agencies; 80/20 cupro-N. is extensively used for marine condensers because of its freedom from corrosion and season cracking. The term 'N. silver' applies to a wide range of alloys which contain no silver whatever; they are essentially 70/30 brass with the addition of up to 30 per cent of N. The higher the N. content the whiter the colour. The N. silvers also have good corrosion resistance and are used for spoons, forks, tureens, etc., generally in the electro-plated condition (E.P.N.S.). Alnico is an aluminium-cobalt-N. alloy developed to give the high B-H values required for permanent magnets. N. is also present in small percentages in many other alloys, e.g. up to 2 per cent in bronzes and aluminium alloys, and is a valuable constituent of many alloy steels.

*Nickel steels.* N., when added to a plain carbon steel in small percentages, dissolves in the ferrite, which it stiffens and so increases the tensile strength of the steel at the rate of about 2 tons/in.<sup>2</sup> for every 1 per cent added, but there is hardly any loss of ductility, e.g. 3½ per cent N. in an annealed 0.30 per cent carbon steel increased the tensile strength from 30 tons/in.<sup>2</sup> to 40 tons/in.<sup>2</sup>, with a slight improvement in ductility. Further additions of N., however, render the gamma-alpha change so sluggish that, depending upon the carbon content, some of the brittle constituent, martensite, begins to appear in the structure of even the annealed steel at about 8 per cent N. and the ductility falls off markedly. At about 15 per cent N. the ductility begins to improve again, accompanied by a fall in tensile strength, because the softer gamma constituent, austenite, begins to appear. At 30 per cent N. the transformation has become depressed to below room temp. and the alloy is wholly austenitic and non-magnetic. For ordinary structural purposes the N. content seldom exceeds 5 per cent because (a) N. is an expensive metal and the improvement in properties is more rapid for the first 5 per cent than for subsequent additions, and (b) steels containing much more than 5 per cent N. are more difficult to forge. The effect of N. on the properties is illustrated by the figures given in the table on p. 234.

In addition to the enhanced combination of strength and ductility which up to 5 per cent of N. confers upon steel, another property, resistance to shock as measured by the Izod impact value, is also improved as shown in the above table. In another example a 3½ per cent N. steel and a carbon steel were both heat-treated to 50 tons/in.<sup>2</sup> tensile strength; the impact values were 58 and 45 foot-pounds respectively.

N. steels permit a much slower rate of cooling from hardening temp. without loss of hardness, and the depth to which the steel hardens is much greater than in carbon steels. For this reason oil may be used as the quenching medium and the

	Carbon per cent	Nickel per cent	Tensile strength tons/in. <sup>2</sup>	Yield Point tons/in. <sup>2</sup>	Elongation per cent	Reduction of area per cent	Isod Impact ft.-lb.
Carbon steel	0.31	nil	39	29	28	66	55
Nickel steel	0.31	3.25	53	43	22	56	61

(Both steels had been quenched and then tempered at 600° C.)

risk of distortion of complicated structures is minimised. At the same time, large bars 6 in. in diameter or more will attain almost the same hardness at the centre as at the outside, a condition impossible with a carbon steel. On account of the slow rate of grain growth of N. steels excessive grain size does not result from high forging and hardening temps. These properties are the result of the slow rate of diffusion of N. in the solid state and the consequent sluggishness of the steel transformations. The austenitic 30 per cent N. steels find application, with the addition of other alloys, where hot strength and resistance to high temp. scaling are important, e.g. gas and steam turbine blading and engine valves.

**Nickel-chrome steels.** The combination of N. and chromium together in structural steels offers advantages which cannot be obtained with equivalent amounts of either of these elements alone. A few of these advantages are higher elastic ratio, greater hardness and higher impact and fatigue resistance, and resistance to abrasion. Chromium inhibits the tendency of N. to graphitise the iron carbide, a function performed by manganese in N. steels, and therefore less manganese is used in N.-chrome steels. Chromium, like N., also suppresses the transformation temp. of the steel and therefore increases the deep-hardening and air-hardening properties. The latter is influenced by the N. content, e.g. a steel containing 1 per cent chromium and 3 per cent N. air-hardens markedly, while with the same amount of chromium and only 1-2 per cent of N. present air-hardening is not appreciable. A 4½ per cent N., 1-1½ per cent chromium steel is fully air-hardening. A popular range of N.-chrome steels contains 0.25-0.4 per cent carbon, 1 per cent chromium, and 2.5-3.5 per cent N. By oil quenching and tempering at appropriate temps. a wide range of properties is possible. Despite the high tensile strength range of 50-65 tons/in.<sup>2</sup> the steels machine well in the fully heat-treated condition and can therefore be put into service as connecting-rods, axles, gears, crankshafts, etc., without further heat-treatment. Stainless steel is an 18 per cent N., 8 per cent chromium steel which has very high resistance to corrosion. Being austenitic it cannot be hardened and tempered.

**Nickel-chrome-molybdenum steels.** N.-chrome steels suffer from temper brittleness if air-cooled from tempering. To avoid this oil-cooling is necessary. Alternatively the incorporation of small

amounts of molybdenum achieves the same object; 0.25-0.30 per cent is usual.

**Nickel Silver,** see GERMAN SILVER.

**Nicobar Islands,** group of 19 is. in the Bay of Bengal, between 6° 45' and 9° 15' N. and 93° and 94° E., between Sumatra and the Andaman Is., and under the administration of the Gov. of India. The Dutch ceded the group to the British in 1869. The is., of which only 12 are inhab., have an aggregate area of about 635 sq. m. There are 2 groups, Great and Little Nicobar, and sev. others to the S., and Car Nicobar, Camorta, and the remainder to the N., separated by Sombro Channel, 36 m. broad. Great Nicobar is the largest is., with an area of 333 sq. m., and Car Nicobar (49 sq. m.) is the most densely pop. (4000). The best harbour is Nankauri, formed by Camorta and Nankauri. The coco-nut is the prin. tree grown, 3,000,000 nuts being produced annually; betel nuts are also found. The inhab. are a Far E. race and speak varieties of the Mon-Annam group of languages. The is. were occupied by Jap. forces from Mar. 1942 until 1945.

**Nicodemus,** Pharisee and member of the Sanhedrin, a 'man of authority among the Jews' (John iii). Jesus early won his secret allegiance and gave him the memorable discourse on the new birth. Jesus styles him 'the teacher of Israel,' probably meaning a Rabbi as interpreter of the law. Cautious, even timid, N. sought Jesus by night to avoid critical eyes. Yet in the Sanhedrin, when his colleagues proposed to condemn Jesus unheard, N. had the courage to risk suspicion by contending for a fair and legal procedure. In the end he joined Joseph of Arimathea in providing honourable burial for Jesus in the rock-hewn garden grave of Joseph.

**Nicodemus, The Gospel of,** Apocryphal writing which had much influence on the religious thought of medieval times, consisted of 2 distinct works. The first contains an account of the trial of Christ before Pilate, a work which seems to have been extant separately under the title of *Acta Pilati*. It is for the most part a compilation of excerpts from the accounts of Christ's trial in the canonical gospels. This work exists in sev. forms, both in Greek and Latin, in some of which N. writes the work in Hebrew; in others he is represented as translating it into Greek. In style it appears to be the work of a Jew. The 2 Gk forms seem to have emanated from a common source composed early in the 2nd cent. The second part, *Descensus ad Inferos*, is a much more rhetorical product. It purports

to be by Simeon and his 2 sons who had risen from the dead at Christ's resurrection. They describe what took place in Hades when Christ descended there, the Harrowing of Hell. It was written, possibly, in the 3rd cent. The old legend that Joseph of Arimathea brought Christianity to Britain in the time of Vespasian, on which Robert de Boron based his poem about the holy grail and the table of the Last Supper, is in some way connected with the G. of N.

**Nicol, Erskine** (1825-1904), painter, was b. Leith. He lived in Ireland from 1845 to 1849, and returning to Edinburgh was elected a member of the Scottish Academy. In 1862 he settled in London. His paintings, the best of which are scenes of Irish life and customs, include 'Among the Old Masters,' 'Both Puzzled,' 'Paying the Rent,' 'The Trio,' and 'Interviewing the Member.'

**Nicol Frism**, see POLARISATION OF LIGHT.

**Nicolai, Christoph Friedrich** (1733-1811), Ger. author and bookseller, b. Berlin. In his youth he was a friend of Lessing and Moses Mendelssohn, and in conjunction with the former he estab. the famous *Briefe, die neueste Literatur betreffend*, 1759-65. Later his reactionary attitude against the new literary tendencies caused him to be bitterly attacked by Herder, and by Goethe and Schiller in their *Xenien*; so that his real merit came to be overlooked. His works include *Beschreibung einer Reise durch Deutschland und die Schweiz*, 1783-97, *Anekdoten von Friedrich II.*, 1788-92, and a rationalistic novel, entitled *Sebalus Nothanker*, 1773-1776. See lives by R. Amer, 1912, and F. C. A. Phillips, 1926.

**Nicolai, Otto** (1810-49), Ger. composer, b. Königsberg. He lived in Italy in 1838-1841 and produced sev. it. operas there. From 1841 to 1847 he was first *Kapellmeister* of the Court Opera at Vienna, and was the founder of the Philharmonic concerts there. In 1847 he was appointed conductor of the cathedral choir and the opera in Berlin, where 2 months before his death, his comic opera *The Merry Wives of Windsor* was produced, a sparkling work by which alone he is now known.

**Nicolaitans**, heretical sect of the Christian Church flourished in the 2nd cent. Their cult of libertinism was probably evolved from pagan rites and a rejection of the rules of Deuteronomy xxiii. There are links with the doctrines of Balaam (Rev. ii. 14; Jude; 2 Peter i.).

**Nicolas, St.**, see NICHOLAS.

**Nicolas, Sir Nicholas Harris** (1799-1848), antiquary and biographical writer, b. Dartmouth, Devon (though his family, originally Breton, had been settled in Looe, Cornwall, since 1685). In 1823 he pub. his *Index to the Herald's Visitations in the British Museum*. Among his most important works are *Notitia Historica*, 1824 (pub. as *Chronology of History*, 1833), *Despatches and Letters of Lord Nelson*, 1844-6, *History of the Battle of Agincourt*, 1827, and an unfinished *History of the Royal Navy*, 1847.

**Nicole, Pierre** (1625-95), Fr. theologian

and philosopher, b. Chartres. His most important works, *Moral Essays and Theological Instructions*, 1671-8, *Treatise on Human Faith*, and *The Perpetuity of Faith in the Catholic Church concerning the Eucharist*, 1669-74, the last written in conjunction with Arnould. With Arnould, Le Maistre, Lancelot, and others of the most distinguished scholars of the age, N. was a permanent inmate of the community of Port Royal, famous for its adhesion to the Jansenist movement.

**Nicoll, John Ramsay Allardyce** (1894- ), literary historian, b. Glasgow. Educ. at Stirling High School and Glasgow Univ., he became lecturer, and then prof. of English at King's College, London. After holding the chair of drama at Yale for a time he became prof. of English at Birmingham in 1945. A leading authority on the development of the drama, he wrote histories of *Restoration Drama*, 1923, *Eighteenth Century Drama*, 1925, *Late Eighteenth Century Drama*, 1927, *Early Nineteenth Century Drama*, 1930, and *Late Nineteenth Century Drama*, 1939, as well as *The Development of the Theatre*, 1948, and *World Drama*, 1949. He also pub. biographies of Blake, 1922, and Dryden, 1923, and ed. the *Annual Shakespeare Survey* from its inception in 1948.

**Nicoll, Robert** (1814-37), poet, b. Auchtermargan, Perthshire. His first poems were printed in 1835. He successfully ed. the *Leeds Times* from 1836, but is chiefly remembered as a Scottish poet. Had his life not been cut short, N. would probably have attained great distinction. See life by P. R. Drummond, 1884.

**Nicoll, Sir William Robertson** (1851-1923), clergyman and journalist, b. Lumsden, Aberdeenshire. Educ. at Aberdeen Grammar School and Univ., he was Free Church minister of Dufftown, 1874-7, and later of Kelso. He then came to London and ed. the *Expositor* and *British Weekly*, together with the *Bookman*, estab. by him in 1891, and *The Woman at Home*, which he founded in 1893. He was editor of the *British Weekly* for the rest of his life. His pub. include *Songs of Rest*, 1879, *Life of James Macdonnell*, 1890, *Anecdotes of the Nineteenth Century*, 1895-6, *The Expositor's Dictionary of Texts*, 1897, *Letters on Life*, 1901, *The Church's One Foundation*, 1901, a life of 'Ian Maclaren,' 1908, and *Professor Elmslie*, 1911. He also ed. the complete works of Emily Brontë, 1910. He was knighted in 1909 and made a companion of honour in 1921. His *Life and Letters*, by T. H. Darlow, appeared in 1925.

**Nicoll, Charles Jules Henry** (1866-1936), Fr. bacteriologist, b. Rouen. Appointed director of the Pasteur Institute at Tunis, he studied N. African infectious diseases, discovering the transmission of typhus by lice, and leishmaniasis by the dog flea. In 1928 he received the Nobel prize for medicine. In 1932 he became prof. at the Collège de France in Paris.

**Nicolson, Hon. Sir Harold George**

(1886- ), diplomat, historian, and biographer, b. Teheran, where his father, who later became Baron Carnock, permanent under-secretary at the Foreign Office, was minister. Educ. at Wellington and Balliol College, Oxford, N. entered the Foreign Office in 1909 and served in the embassies at Madrid and Constantinople. He married in 1913 Victoria Sackville-West (q.v.). He was a member of the Brit. delegation to Versailles in 1919, and was lent to the League of Nations staff from 1919 to 1920. He accompanied Lord Curzon to Lausanne, and subsequently became counsellor to the legation at Teheran until his transfer to Berlin in 1927. In 1929 he retired from the diplomatic service to devote himself to politics. He was one of the early members of Sir O. Mosley's (q.v.) new party in 1931, but left the party when its Fascist tendencies became more overt. At the general election of 1935 he was returned as National Labour member for W. Leicester, and became a junior minister in the Churchill gov. of 1940. He joined the Labour party in 1947 and stood unsuccessfully for N. Croydon in the by-election in that year. He was entrusted with the official biography of George V, which was pub. in 1953. His wide culture and sympathy has enabled him to present a diverse selection of subjects, enlightened by a capacity for sharp impressions and built by strong powers of construction. His pubs. include the novels *Some People*, 1927, *Sweet Waters*, 1932, *Public Faces*, 1932, and *The Desire to Please*, 1943; the biographies *Paul Verlaine*, 1921, *Tennyson*, 1923, *Byron: the Last Journey*, 1823-4, 1924, *Swinburne*, 1926, *Lord Carnock*, 1930, *Curzon: the Last Phase*, 1934, *Dwight Morrow*, 1935, *Benjamin Constant*, 1949, and *King George V*, 1952; the historical works *Peacemaking*, 1933, and *The Congress of Vienna*, 1946; and sev. vols. of essays, including *The English Sense of Humour*, 1956. He was knighted in 1953. His *Good Behaviour* was pub. in 1955.

**Nicolson, William** (1655-1727), prolate and antiquary, b. Cumberland. He occupied the sees of Carlisle and Derry, and finally rose to be Archbishop of Cashel in Ireland. His prin. work was the 'Historical Library,' consisting of Eng., Scottish, and Irish sections. He also contributed a *Glossarium North-hymbricum* to Ray's *Collection of English Words*.

**Nicomachus** (fl. c. 400 BC), Gk physician of Macedonia, was the father of Aristotle. He was patronised by Amyntas II, King of Macedonia.

**Nicomachus of Thebes** (fl. c. 400 BC), celebrated Gk painter, son of Aristodemus (q.v.), whose pupil he became. He is spoken of as one of the most remarkable of the painters of antiquity. His skill is praised by Cicero, and he was renowned for his rapidity of execution. Pliny lists his works which included an 'Apollo and Artemis' and 'The Rape of Proserpine.'

**Nicomedes**, name of 4 kings of Bithynia: (1) Reigned 278-250 BC, was the eldest son and successor of Zipoetes. He

founded the city of Nicomedia (q.v.). (2) *Nicomedes Epiphanes*, reigned 149-128 BC, son and successor of Prusias II whom he dethroned and put to death. He was a faithful ally of Rome. (3) *Nicomedes Euergetes*, son and successor of the last, reigned 128-94 BC. (4) *Nicomedes Philopator*, son of the foregoing. He d. after a troubled reign, in 74 BC, and, having no issue, bequeathed his kingdom to the Rom. people.

**Nicomedia** (modern Izmit), anct city of Bithynia, Asia Minor, at the N.E. corner of the gulf of that name, an arm of the sea of Marmora. It was the seat of the Bithynian kings, and the abode of Hannibal, Diocletian, Constantine, and Arrian the historian. See further under BITHYNIA and IZMIT.

**Nicopolis**: 1. (Gk, 'city of victory'), anct city of Epirus, Greece. It was situated on the Gulf of Arta, and was founded by Octavian to commemorate his victory at Actium in 31 BC. Many Rom. antiquities are to be seen on the site.

2. Tn of Bulgaria, see NIKOPOL.

**Nicosia** (Gk *Lefkosia*), cap. of the is. of Cyprus and a Gk Orthodox archbishopric, lies near the centre of the great plain of the Mesaoria, on the r. b. of the R. Pedias, 37 m. from the port of Famagusta. The old tn has interesting memorials of its medieval rulers in the shape of its anct cathedral and bastion walls. Textile goods and leather are the prin. manufs. It is the seat of the Brit. governor. Modern suburbs are extending rapidly beyond the walls. The airport is of growing importance. The railway is now disused. Estimated pop. (1954) 42,000, of whom about a third are Turks.

N. does not appear as the cap. until the Lusignan dynasty, but the great number of anct tombs going back to 3000 BC indicate that this was the site of a city from remote times. It is suggested that the site of the present tn may have been the city of Ledra, founded by Lefcon, son of Ptolemy Soter (280 BC). The earliest mention of N. (as Cossia) is that made by Willbrand, Count of Oldenburg, in 1211 (see Cobham, *Excerpta Cypria*, 1908). Danto, in *Paradiso*, refers to its luxurious life under its king, Henry II, and it was here that St Louis of France estab. himself with that monarch when on his way to the fourth crusade. The period of luxury ended in the early 15th cent. when the Mamelukes landed in the is. and marched on N., which they pillaged in 1426. At the end of the 15th cent. N. had 250 churches and 50,000 inhab., chiefly Italians, French, Greeks, and various peoples of the middle E. countries, and the circuit of the city extended for 7 m. The Venetians, who were then in military occupation, began to fortify the is. against an expected Turkish assault (1567). In fortifying the city they destroyed everything outside their new circumvallation, including the monastery and royal castle of St Domenico. In 1570 the long-expected siege of N. was launched by Mustapha Pasha, whose army spent 2 months in reducing the place. It is said that 20,000 Christians

were slain in the street fighting which followed the fall. The 300 years of Turkish occupation were, generally, uneventful.

In 1741 N. was damaged by an earthquake and a minaret of St Sophia Mosque fell to the ground. In 1878 the Brit. Admiralty ordered Vice-Adm. Lord John Hay, then off Crete, to take over Cyprus and to raise the Brit. flag over N. These instructions were carried out. The Paphos Gate, known in the Middle Ages as the Porta Domenico, was closed by the

The Kyrenia Gate, also erected by the Venetians, has in recent years been isolated and new entrances cut in the walls on each side of it. St Sophia, once the cathedral and now the prin. mosque of N., stands in the centre of N. and its twin minarets are a prominent landmark. It is built after the plan of a Fr. cathedral of the 13th cent. and its chief feature is the parvis, with its 3 splendidly decorated doorways comparable with any in Europe. Opposite the E. door of the mosque is the Turkish



*Camera Press*

#### ST SOPHIA MOSQUE, NICOSIA

This was originally a Roman Catholic cathedral, but became the chief place of worship for the Muslims when Cyprus was occupied by the Turks in the sixteenth century. Two tall minarets were then added.

British when they made a new entrance through the city walls. The anct Franciscan church was destroyed in the great siege, but a new church, the Rom. Catholic church of the Holy Cross, took its place. The Armenian church of the Blessed Virgin Mary was formerly the Benedictine abbey of our Lady of Tyre. During the siege of 1570 the Armenians, out of hatred for the Latins, helped the Turks, and received this church as a reward. Near the law courts and in the centre of the Konak Square is the Venetian column, the symbol of Venetian domination erected in the various colonies held by the rep., which was once crowned by the Lion of St Mark. It was taken down by the Turks, but restored to its present position in 1917. It is a monolith of grey granite and probably came from a temple of Salamis.

library founded by Sultan Mahmud in the last cent. Another notable building is the Bedestan, which has been erroneously supposed to be the church of St Nicholas founded in memory of Thomas à Becket, and which was, prior to 1570, the Orthodox metropolis of the Venetian period in N. St Catherine's, now known as Hajdar Pasha, after the mosque the most important Gothic building remaining in N., was erected towards the end of the 14th cent. The Famagusta Gate was the chief gate of the city and is the prin. monument of the Venetian era in N. It is built as a copy of the Lazaretto Gate at Candia. The Orthodox bishopric, or church of St John, is probably built on the same site as the old abbey of St John the Evangelist, which belonged to the Benedictines. For other monuments see Sir E. Storrs and

B. J. O'Brien, *Handbook of Cyprus*, 1930, and R. Gunns, *Historic Cyprus*, 1938. During the riots of 1931, which were fomented by agitators for union with Greece (*enosis*), Gov. House was burned down; further rioting began in 1955 after the formation of the organisation called EOKA which, in support of *enosis*, opened a campaign of violence (see CYPRUS).

Nicotia, tn in Sicily (q.v.), built on rocky hills nearly 3000 ft above sea level, 15 m. NNE. of Enna (q.v.). It has a cathedral (13th-17th cents.) and other anct churches. The numerous Crusaders' tombs in N. include many inscribed with Eng. names. There are salt-mines and sulphur springs near by. Pop. 19,200.

Nicot, Jean, Sieur de Villemain (1530-1600), Fr. diplomat and philologist, b. Nîmes, became a lawyer. In 1560, during the reign of Henry II, he was sent as ambas. to Lisbon. On his return from Portugal he introduced the tobacco plant into France (hence the name nicotine). N. was the author of a *Historia Francorum* and *Le Trésor de la langue française*.

Nicotiana, genus of plants (family Solanaceae), a number of which are grown in the garden as half-hardy annuals. *N. alba*, the sweet-scented tobacco plant, bears panicles of white funnel and star-shaped flowers. *N. tabacum* is the tobacco plant of commerce.

Nicotianin, volatile oil to which tobacco owes its flavour. It contains 4 alkaloids: nicotine, nicotimine, nicotine, and nicotelline.

Nicotinamide, see NICOTINIC ACID.

Nicotine ( $C_{10}H_{11}N_2$ ), alkaloid found in the leaves of the tobacco plant in the form of the malate and citrate. It may be prepared by extracting the oil from the leaves with boiling water, mixing it with milk of lime, and distilling; the distillate is treated with oxalic acid, concentrated, treated with potash, and the N. extracted with ether. N. is a colourless oil, but rapidly turns brown on exposure to air. It boils at 246-273° C. and readily dissolves in water and alcohol. It has a pungent odour, similar to that of a foul tobacco pipe. N. is exceedingly poisonous, a few drops in the stomach being sufficient to cause death, while a grain has been known to cause symptoms of poisoning. N. is used as an insecticide in greenhouses, etc. It was synthesised in 1904.

Nicotinic Acid and Nicotinamide. N. A., oxidation product of nicotine, is the  $\beta$  monocarboxylic acid of pyridine ( $C_6H_5N$ ) and has the formula  $N-C_5H_4-COOH$ . It is one of the vitamins of the B<sub>3</sub> complex. It occurs in liver, yeast, wheat, rice, etc., and is said to be so stable that it has been detected in barley taken from the tomb of Tutankh-Amen (1350 BC). Shortage of N. A. in the diet is responsible for the skin disease of pellagra (q.v.), which is common in peoples living chiefly on maize. Nicotinamide ( $NC_5H_4CO-NH_2$ ) is the acid amide of N. A. and has similar physiological properties to the acid itself. Diethylnicotinamide ( $NC_5H_4CO-N(C_2H_5)_2$ ) is used in medicine (under the trade name of 'Coramine') for its action on the

medulla of the brain, where by stimulating the respiratory centre it accelerates breathing and by its action on the vasomotor centre it raises the blood pressure; hence it is useful in reviving people who have collapsed, e.g. on the operating table.

Nidaros, see TRONDHEIM.

Niddersdale, picturesque vale of Yorks, England, situated in the W. Riding, traversed by the Nidd, which issues from the base of Wharfedale, and after a generally SE. course empties into the Ouse near York. Water is supplied to Bradford from a dam above Pateley Bridge.

Nidwalden (Switzerland), see UNTERWALDEN.

Niebuhr, Barthold Georg (1776-1831), Ger. statesman and historian, b. Copenhagen, son of the traveller Carsten N. (q.v.). In 1810 he became royal historiographer and prof. at Berlin, and by a course of lectures on Rom. hist. estab. his position as one of the then most original and philosophical of modern historians. In 1816 he went to Rome as Prussian ambas., and during his residence there discovered and pub. fragments of Cicero and Livy, and contributed to the great work on the topography of anct Rome by C. C. von Bunsen and E. Platner (1773-1855). He resigned the royal hist. post in 1823 and settled at Bonn, where he spent practically the whole of the remainder of his life. Here he rewrote and pub. the first 2 vols. of his *Roman History* (first pub. 1811-12) and delivered lectures on the Fr. Revolution, geography, ethnography, and anct hist. The first 2 vols. were trans. (1822) by J. C. Hare and C. Thirwall, and the third (bringing the narrative down to the end of the first Punic war) by Smith and L. Schmitz, 1832.

See D. Hensler, *Lebensnachrichten*, 1838-9; and lives by J. Classen, 1876; Eissenhart, 1886; F. Schnabel, 1931.

Niebuhr, Carsten (1733-1815), Ger. traveller and author, b. Luddingworth, Hanover. In 1761 he joined an expedition sent out by the King of Denmark for the scientific exploration of Egypt, Arabia, and Syria. He returned in 1767 as the sole survivor. In 1778 he accepted a position in the civil service of Holstein and went to live at Meldorf. The result of his travels appeared in his *Beschreibung von Arabien*, 1772, followed by *Reisebeschreibung von Arabien und andern umliegenden Ländern*, 1774-8, and *Reisen durch Syrien und Palästina*, 1837. See life by his son, B. G. Niebuhr, 1817 (Eng. trans., 1828, by Mrs Austin in the lives of Eminent Men series).

Niebuhr, Reinhold (1892-), Amer. Protestant theologian, b. Wright City, Missouri. Prof. of Applied Christianity (Christian ethics) at the Union Theological Seminary, New York, since 1930. He expounds a biblical theology, orientated to the present day, which has found some acceptance outside the U.S.A. See E. L. Allen, *Christianity and Society: a Guide to the Thought of Reinhold Niebuhr*, 1950.

Niederösterreich, see AUSTRIA, LOWER.

**Niedersachsen**, see LOWER SAXONY.

**Niederwald**, mt ridge in the *Land of Hesse* (q.v.), Germany. It is the W. end of the Taunus (q.v.) range, and rises above the Rhine opposite Bingen (qq.v.). Its S. slopes are noted for their vineyards. It is crowned by a monument erected in 1883 to commemorate the estab. of the Ger. Empire in 1871 (see GERMANY, *History*).

**Niegos, Petrovic**, see DANILO I.

**Niel, Adolphe** (1802-69), Fr. marshal, b. Muret, Haute-Garonne, France. He served in Africa, and distinguished himself at the capture of Constantine in 1837. In 1849 he was engaged in the siege of Rome, and took the Malakoff redoubt near Sebastopol in 1855; 3 years later he pub. *Le Siège de Sébastopol*. He again distinguished himself in the battle of Solferino, 1859, when Napoleon III made him marshal. N. was appointed minister of war in 1867.

**Niel**, tn in Belgium, on the R. Rupel, 9 m. SSW. of Antwerp. There are brick kilns and manufs. of pantiles, floor tiles, cement, and pottery. N. has some small shipyards. Pop. 10,800.

**Niello** (It. form of Lat. *nigellum*, diminutive of *niger*, black), name of the method of ornamenting a polished metal surface by filling in incised lines with a black metallic amalgam, which has been practised from very early times up to the present day. The amalgam is made up of silver, copper, and lead, heated and then poured into flowers of sulphur. The earliest specimens of N. date from Rom. times. The use of N. has also been revived by a few Eng. craftsmen. The invention of printing from engravings on metal plates was undoubtedly suggested in great measure by N. See A. M. Hind, *Nielli, chiefly Italian of the fifteenth century, in the British Museum*, 1936.

**Nielsen, Carl** (1865-1931), Dan. composer, b. Nørre-Lyndelse. Being poor as a youth, he joined a military band at the age of 14, but at 18 succeeded in entering the Copenhagen Conservatory as a pupil of Gade. In 1891 he entered the royal orchestra and was its conductor in 1908-1914. He also became conductor of the Musical Society and director of the Conservatory. With an independent style and a strong sense of counterpoint and melody, N. is one of the most important of Scandinavian composers. Works include (operas) *Saul og David*, 1903, *Maskarade* (after Holberg), 1907, and others; incidental music for Oehlenschläger's *Aladdin*; 6 symphonies (II. *The Four Temperaments*, III. *Espania*, VI. *Sinfonia semplice*), *Saga-Dream* for orchestra; chamber and piano music, songs, etc. See R. Simpson, *Carl Nielsen*, 1952.

**Nielsen, Holger**, see ARTIFICIAL RESPIRATION.

**Nielsen, Haraldur** (1868-1928), prof. of theology in the univ. of Iceland. In the revised version of the Icelandic Bible (1908) the trans. of the O.T. is his work. Together with his friend, E. H. Kvaran (q.v.), he initiated the spiritualist move-

ment in Iceland (1904) and was a keen psychical researcher. He was an eloquent preacher in the Church of Iceland. See his collected sermons, *Arin og eilífin* (Time and Eternity).

**Niemsch** (or **Niemsch**), **Nikolaus von Strehlenau**, see LENAUS, NIKOLAUS.

**Niemcewicz, Julian Ursin** (1757-1841), Polish scholar and statesman, b. in Lithuania. He served for a short time in the army and became acquainted with Kosciusko, with whom he was taken prisoner at the battle of Maciejowice in 1794, and was secretary of state and president of the Constitutional Committee in Poland after the Congress of Vienna. Of his works the *Historical Ballads*, 1816, are the most popular, but he also wrote *The Return of the Deputy*, a comedy; *John of Tenczyn*, a novel in the style of Scott; and a *History of the Reign of Sigismund III* (3 vols.), 1819.

**Niemen** (Russian **Neman**, Lithuanian **Nemunas**, Ger. **Memel**), navigable riv. in Belorussia and Lithuania, rising near Minsk and flowing NW. into the Kurisches Hafl of the Baltic Sea. Length 590 m.; chief port, Kaunas.

**Niemöller, Martin** (1892- ), Ger. pastor of the Protestant Evangelical Church and theologian, b. Lippstadt, Westphalia. Served in the First World War as a naval lieutenant and U-boat commander. Ordained 1924, N. became pastor of the wealthy Berlin-Dahlem par. (1931-7). A strong supporter of nationalism and opponent of communism, he welcomed National Socialism (q.v.) and joined the Nazi party, but in 1933 he led a campaign against totalitarian control of the Lutheran Church and became an opponent of the Nazi regime. When the Nazis caused a schism in the Church, setting up the 'Ger. Christians' and virtually establishing the supremacy of the State and its teaching over the Church and its fundamental principles, including the adoption of the Aryan (q.v.) paragraph, N. became leader of the Confessional Church, *Bekennniskirche*, which remained true to Evangelical principles. He founded the Pastor's Emergency League (*Pfarrernotbund*) to defend the Lutheran faith, and helped to draw up the 'six principles' of the Confessional Church at the synod of Barmen (1934). At first the League had 7000 members, but Nazi persecution reduced its numbers, and in 1938 only 1000 persons were left to reject the oath of allegiance to Hitler. N. preached courageously against Nazi domination of the Church and other policies, and his services were crowded. On 1 July 1937 he was put into Sachsenhausen concentration camp, but refused to recant or accept release on the condition that he would undertake not to preach any more. In a secret trial in 1938 before a 'people's court' he was sentenced to 7 months' 'fortress' imprisonment (an honourable prison for officers), and after 8 months was released, only to be rearrested by the Gestapo and kept in 'protective custody' throughout the Second World War. In 1946 he admitted Germany's war guilt at the

International Missionary Council in Geneva, and in 1947 was elected first bishop of the reformed Evangelical Church of Hesse-Nassau. His works include *Vom U-Boot zur Kanzel*, 1934 and *Dass wir an ihm bleiben*, 1935. See H. M. Stückelburger, *Der Kampf der Bekenntniskirche*, 1945.

**Niemsch von Strehlenau, Nikolaus, se** LENAÜ.

**Niepce, Joseph Nicéphore** (1765-1833, Fr. physicist and an inventor of photography, b. Châlon-sur-Saône. From 1791 to 1801 he was administrator of Nice when he returned to his native place and directed his energies to chemical research with his brother Claude (1763-1828). In 1811 he turned his attention to lithography, in 1827 produced a photograph on a metal plate; in 1829 he joined Daguerre in his work, and after years of experimenting together they discovered the process of chemically amplifying the photographic image.

**Nierembergia** (named after J. E. Nieremberg), genus of the family Solanaceae, allied to *Petunia*. There are 20 species native to tropical America, perennial herbs and shrubs, frequently cultivated. *N. caerulea*, *N. calycina*, and *N. frutescens* are grown as half-hardy annuals or greenhouse plants.

**Nierstein**, Ger. vil. in the Land of Rhine land-Palatinate (q.v.), in the Rhine (q.v.) valley, 8 m. S. of Mainz. Its white wine, *Niersteiner*, is greatly prized. Pop. 5000.

**Nietzsche, Friedrich Wilhelm** (1844-1900), Ger. philosopher of aristocratic Polish extraction, was b. Röcken, near Lützen, the son of a Lutheran pastor. After a brilliant univ. career at Bonn and Leipzig he was appointed, in 1869, prof. of Greek at Basel. This post he resigned in 1879 owing to ill-health, retiring on a small pension. In 1889 he went mad, and, after remaining so for 11 years, he d. at his sister's house in Weimar. To these few biographical details must be added (for it is the key to much in his philosophy) the fact that his life was one long struggle against sickness, neuralgia and insomnia being its prin. manifestations.

N.'s philosophy can be expressed in a few words. He regarded humanity as being composed of 2 types fundamentally different from each other: the weak and the strong, the slavish and the masterful, the mob and the aristocratic few. In the struggle between these 2 types each would naturally seek to impose its morality on the other and to deprecate those qualities in its opponent that are dangerous to it. Thus the weak commend the qualities of meekness and compassion, extol poverty and renunciation. Because Christianity, which, according to N., extolled this 'slave morality', he was opposed to it and proclaimed himself Antichrist. He would revalue all values in the light of the morality of the strong. And for mankind he held up the ideal of surpassing itself, the need for creating a higher, stronger, and more dominant race, the Superman. These ideals are set forth in his many books, but chiefly in

the lyrical and epigrammatic *Thus Spake Zarathustra*.

A complete ed. of N.'s works in Eng. (18 vols.) has been ed. by Dr Oscar Levy (1909-12). See E. Förster-Nietzsche, *Das Leben Friedrich Nietzsches* (3 vols.), 1895-1904; F. C. Copleston, *Friedrich Nietzsche, Philosopher of Culture*, 1942; R. M. Thompson, *Nietzsche and Christian Ethics*, 1951; F. A. Lea, *The Tragic Philosopher: a Study of Friedrich Nietzsche*, 1957.



E.N.A.

F. W. NIETZSCHE

**Nieuwland, Pieter** (1764-94), Dutch poet and mathematician, b. near Amsterdam. He became prof. of mathematical and physical science at Leyden. His *oésies hollandaises*, 1788, contain some fine pieces, among which may be mentioned the poem *Orion* and the elegy on the death of his wife. His scientific works include *Almanach nautique*, with Van Swinden; *Disserations sur la construction des océanis de Hadley*, 1788, *Discours sur les moyens d'accélérer l'art nautique*, 1789, and *L'Art de la navigation*, 1793.

**Nieuwpoort** (Fr. Nieuport), tn in the prov. of W. Flanders, Belgium, 21 m. WSW. of Bruges. It stands on the R. Yser (q.v.) about 2 m. S. of its mouth and is the junction of sev. canals. It is one of the less important Belgian seaports, but has a fishing fleet. By opening the sea-locks in Oct. 1914, thus inundating the lower polders as far as Dixmude, the Ger. advance could be stopped at the Yser. During the war the city was completely destroyed and its interesting



buildings, the cloth hall, the belfry, and the Gothic church, were lost. Rebuilt, the city suffered again very much in the Second World War. It is engaged in fishing, and there are oyster parks, salt works, and manufs. of ropes, sails, and nets. It has sev. war memorials. Pop. 6500. Nieuwpoort-Baden, 2 m. from the tn, is a fashionable seaside resort.

**Nievis**, see NEVIS.

**Nièvre**, dept of central France, formed of the old prov. of Nivernais with a part of Orléanais. It belongs to the basins of the Loire and Seine. The surface is rugged in the E., comprising part of the granitic mts of the Morvan, of which the highest point within the dept is Prénéley (2790 ft). Forests cover large areas, but much land is given over to pasture and the cultivation of forage, the fattening of cattle and the rearing of sheep and horses being important agric. industries. The chief cereals are oats and wheat, but potatoes are largely cultivated. Vines are grown in the valley of the Loire and in the neighbourhood of Clamecy, the white wines of Pouilly being famous. The prin. mineral is coal, which is found in the neighbourhood of Decize, and the chief manufs. are iron and steel at Guérogny, Fourchambault, and Imphy. The prin. tns are Nevers (the cap.), Château-Chinon, Clamecy, and Cosne (q.v.). Area 2658 sq. m.; pop. 240,100.

**Niffer**, or **Nuffar**, see NIPPUR.

**Niger**, **Gaius Pescennius**, governor of Syria, was a Roman of equestrian rank. He was chosen emperor by the troops in AD 193 on the death of Commodus; but, failing to march on Rome at once, was intercepted by Severus, a rival claimant. Three battles were fought, resulting in the defeat of Pescennius, who fled towards the Euphrates. He was captured and put to death, AD 194.

**Niger** (the name is not derived from the Lat. adjective for 'black' but from a Libyan and Sudanese root, meaning 'water' or 'river'). The word was used by Ptolemy in the Gk form of *nigêr* and is used at the present time by Lake Chad tribes in the form *nîer*, important riv. system of W. Equatorial Africa, ranking next in size to the Congo and the Nile. It rises in the country of the Mandingoes, about 150 m. from the coast, and flows N. and NE. towards the Sahara, then SE. and S., finally entering the Bight of Benin in the Gulf of Guinea by an enormous delta (14,000 sq. m. in area), which extends nearly 150 m. inland. Its chief stream, the Tembi, is joined by the Tamincono and the Falico, all rising in the mountainous region of NE. Sierra Leone. Lower down, at its confluence with the Tankisso, it is called the Babaa or Joliba. At Bamaku in Bambarra it becomes navigable for steamers, and after passing Sansanding it divides into sev. arms, enclosing extensive is. The Niger's chief l. b. trib. is the Benué (q.v.) or Chadda, joins it opposite Lokofa, and being navigable from Adamawa affords communication with the interior. The Bussa rapids, in which the explorer Mungo Park was drowned (1805), are below the junction of

the Sokoto and the Niger. Total length about 2600 m.; area of basin 600,000 sq. m.

Mangrove forests form the chief vegetation of the remarkable delta region. The Upper Niger was explored by Mungo Park (1795-7 and 1805), the Middle by Barth (1851-4), and the Lower by Clapperton (1826-7) and Lander (1830). Among other explorers are Houst (1896), Lenfant (1903), and Talbot (1904). The riv. is British from its mouth to the end of navigation; above that part it is French. See J. Thompson, *Mungo Park and the Niger*, 1890; A. Mockler-Ferryman, *Up the Niger*, 1893; J. K. Trotter, *The Niger Sources*, 1898; A. G. Leonard, *The Lower Niger and its Tribes*, 1906; B. Alexander, *From the Niger to the Nile*, 1907; P. Germann, *Mungo Park*, 1924; M. Abadie, *La Colonie du Niger*, 1927; E. P. Stebbing, *The Forests of West Africa and the Sahara*, 1937; C. Hanin, *Occident noir*, 1947; D. Forde, *Peoples of the Niger-Benué Confluence*, 1955.

**Niger Territory** (Fr.), see NIGER and SUDAN, FRENCH.

**Nigeria**, **Federation of** (from very early times the land of the Niger—Negritia of the ancients—on the derivation of which name see NIGER, a Brit. colony and protectorate of Brit. W. Africa extending between the Lower Niger and Lake Chad, rapidly approaching self-governing status. It is situated on the NE. shore of the Gulf of Guinea, and enclosed roughly by parallels of lat. 4° and 14° N. and by the meridians of long. 3° and 14° E. It is bounded on the N. and NW. by the Fr. Sudan, on the S. and SW. by the Gulf of Guinea, and on the W. by Dahomey (Fr.). Greatest length from N. to S., 650 m. The area of Nigeria, including the trusteeship ter. of the Cameroons (q.v.), is approximately 373,250 sq. m. The country is divided into the N., E., and W. Regions and S. Cameroons. Lagos is an area of 27 sq. m. (pop. 324,000), containing the Federal cap. N. Region, pop. 17,714,000, cap. Kaduna, area 281,782 sq. m.; E. Region, pop. 7,782,000, cap. Enugu, area 29,484 sq. m.; W. Region, pop. 6,613,000, cap. Ibadan, area 45,376 sq. m.; S. Cameroons, pop. 953,000, area 16,581 sq. m.

The country is usually divided into the delta region (swampy, unhealthy, and abounding in mangroves), the forest region (very hilly in parts), and the plateau region in the centre, where the climate is hot but much drier and more pleasant. The harmattan (hot dry wind) blows from the Sahara at certain seasons. The fine particles of sand, individually invisible to the naked eye, collectively appear as a huge dark cloud blotting out the sun and making air navigation a serious hazard. These fine particles of sand reach ships many miles out to sea, more than 1000 m. from the Sahara.

**Administration.** The constitution of Nigeria is set out in an Order in Council which came into operation in Oct. 1954. This provides for a Council of Ministers comprising the governor-general as president and 10 ministers (3 from each

Region and 1 from the S. Cameroons). There are 3 *ex officio* members, viz. the chief secretary, the attorney-general, and the financial secretary of the Federation. There is a Federal House of Representatives presided over by the speaker, with 184 elected members composed of 92 from the N. Region, 42 from the W. Region, 42 from the E. Region, 6 from the S. Cameroons, and 2 from Lagos. In addition to 3 *ex officio* members (the chief secretary, the financial secretary, and the attorney general), the governor-general may appoint 6 special members to represent special interests. Each of the 3 Regions has its own executive council presided over by the regional governor. In the N. Region there are 3 *ex officio* members in the council as well as the ministers. In the W. and N. Regions there are 2 chambers (Chiefs and a House of Assembly), but in the E. Region a House of Assembly only. In the N. Region there are 4 *ex officio* members in the House of Assembly, and 5 special members appointed by the regional governor; the other members are elected. In the E. and W. Regions all members are elected.

After Jan. 1959 the S. Cameroons ceased to have an Executive Council with the commissioner as president, but a House of Assembly was instituted, with a speaker and 26 elected members.

Membership of the Federal House of Representatives is decided by special elections: in the N. Region and S. Cameroons through electoral colleges; in the W. Region by ballot, all taxpayers being qualified to vote irrespective of age; and in the E. Region by adult suffrage. Owing to the high illiteracy rate in Lagos and in the W. and E. Regions, voting is done by the use of symbols; and the ballot is secret. Elections in the N. Region are carried out along the same lines; but the regional governor may, within limits, vary the procedure. Under the constitution the Federal Legislature has exclusive authority in matters concerning external affairs, aviation, customs, banking, defence, police, mining, mercantile marine, posts and telegraphs, railways, and arterial roads. Other matters may be dealt with either by the Federal or by the Regional Legislature.

The emirs of N. Nigeria mostly stem from the cattle-owning, nomadic Fulani invaders. The degree of personal autocracy exercised by each varies according to custom and temperament. Some are progressive, a few openly reactionary. As a class they possess political instinct, and the development of a big international air junction round Kano put them in touch during the Second World War with world affairs. They are fully conscious of the need for the N. to overcome S. opposition to their rule if their traditional way of life is to survive at all. In domestic life they are frugal. Inhabiting rambling, castellated mud palaces, they maintain large retinues but do not go in for luxuries in the W. sense. The H.Q. secretariat of an emirate is the prin. repository of power.

The secretariat is run entirely by Africans with Brit. advisers holding a watching brief. It deals with almost every branch of administration, including revenue and police.

*Production and exports.* There are great agric. resources in the N. Region. Crops for home consumption include maize, yams, cassava, sweet potatoes, sugar-cane, Guinea corn (or sorghum), ground-nuts, rice, millet, tobacco, plantains, bananas, and beans of various kinds. The prin. agric. exports (with amounts and/or values as at 1954) are: cocoa (98,000 tons, £39,261,000); palm oil (208,000 tons, £13,431,000); palm kernels (464,000 tons, £22,791,000); ground-nuts (428,000 tons, £29,900,000); bananas (£2,863,000); rubber (£2,907,000); cotton (£7,530,000). Other products for export are cotton lint (but cotton is grown mainly for the local industry of hand spinning and weaving), hides and skins, and a variety of timber. Wheat is grown to a small extent; large herds of cattle, sheep, and goats are raised in the N. Region; and in the extreme N. camels are bred. Horses and donkeys are bred, and in common use in the N. part of the protectorate. Tin is the chief mineral produced. In 1954 the total export value of hides and skins, tin ore (10,933 tons, plus 2914 tons of columbite), and timber was £5,172,000. Also in 1954, 45 per cent of total imports came from the U.K., and 9 per cent from Commonwealth countries, while 72 per cent of total exports were destined for the U.K.

Tin ore has been worked and smelted by natives during the last hundred years, and tin is mined by sev. Brit. companies. Bends that could only have been made by man may be seen that have been found in the deep detrital deposits, and they bear no resemblance to any modern ornaments made by tin workers, and, further, the depth at which they have been found precludes a modern origin. The prin. tin-fields are situated on the W. boundary in the Bauchi Prov. and in the provs. of Nassarawa, Zaria, and Kano adjoining the boundary. Tin is also known to exist in the provs. of Ilorin, Calabar, and Yola, but as yet has not been found in payable quantities. The second important mineral of Nigeria is gold, but development is still confined to the alluvial stage. Deposits of lignite and coal have been discovered near Asaba and Udi in the S. Region. A colliery was opened by the gov. in 1915 at Enugu, the coal won being used by gov. depts or sold to the public. This colliery produced 636,000 tons in 1954. There are salt and soda deposits in Bornu Prov. There are no large secondary industries, with the exception of a saw-mill at Sapele, where there is also a modern plywood and veneer factory. Other products are colanuts, capsicum, gums, balsams, and indigo. Citrons, limes, oranges, date-palms, pomegranates, mangoes, and other fruits flourish. Subsidiary companies of Unilever Ltd., especially the United Africa Co., carry on much of the trading and mining operations throughout Nigeria.

Mining rights are vested in the gov.; but under an agreement with the Royal Niger Co. at the date of the revocation of its charter, the company receives half the gross profits from royalties on minerals for a period of 99 years as from 1900. Much of the organised retail trade is in the hands of Syrians and Lebanese; but in the markets African women have a monopoly and wield considerable political influence. There are 4 independent regional marketing boards, for cocoa, palm kernels and palm oil, ground-nuts, and cotton. The ports served by ocean steamers are Lagos, Forcados, Burutu, Warri, Sapele, Bonny, Port Harcourt, Degema, Opoobo, Calabar, Victoria, and Tiko.



F.N.A.

KANO: HOUSES OF PROSPEROUS HAUSAS IN THE NATIVE QUARTER

**Fauna and flora.** The fauna and flora of Nigeria are interesting. Lions, leopards, elephants, giraffes, a kind of buffalo, hyenas, antelopes and gazelles, camels, monkeys, and snakes are found. The rivs. contain numerous varieties of fish, while the crocodile, the rhinoceros, and the hippopotamus are also common. The tsetse-fly and mosquitoes infest the coast dists. and all the delta region. The birds include ostriches, bustards, birds of prey (such as vultures, kites, and hawks), snipes, quails, partridges, ducks, widgeon, and teal, and many varieties of parakeets, pigeons, geese, etc. Among the chief trees are different kinds of palm (notably the oil-palm, *Elaeis guineensis*; the date-palm, *Phoenix dactylifera*; and the doum-palm, *Hyphaene thebaica*), the gambier, the baobab, shea-butter, and locust trees, and the tamarind. In the drier regions mimosa and acacia bloom freely. Mangroves are confined to the swampy coast dist. and form its peculiar vegetation.

**Tribes.** The vast number of tribes in Nigeria precludes any detailed account, but a few of them may be mentioned. Among the coast tribes are the Jekri, Ijoe, Ibo, and Aros; to the S.E. round Calabar dwell the Efiks, Ibibios, and Kwes. The Hausas and Fulani of the N. are much higher races than these coast dwellers. Other tribes are the Munshi, Okpotos, Berberi or Kanuri, and Yorubas.

**Communications.** The W. div. of the Nigerian Railway (3 ft 6 in. gauge) runs from Lagos through Abeokuta, Ibadan, Kaduna, and Zaria to Kano (705 m.). The main line from Kano has been extended to N'Guru (Borku). There are also 4 branch lines, one from Minna to Baro on the Niger (111 m.), Ife junction to Idogo (27 m.), Zaria to Kaura Namoda (137 m.), and Zaria to Jos (135 m., of 2 ft 6 in. gauge track). Port Harcourt is linked with Enugu by a 3 ft 6 in. gauge line, this line being generally known as the E. Railway. It runs through a wide oil-palm belt, and taps the coal-field at Enugu. The line is 593 m. in length and is an alternative outlet for the tin ore and agric. produce of the N. Total rail mileage 1903, and track mileage 2218. There are 31,184 m. of good roads, of which 2022 are tarred. The R.s Niger and Benue are in themselves great natural highways and in the S. there are numerous other navigable waterways which provide means of communication and transport. There is a wireless station at Lagos under the control of Cable and Wireless Ltd., and a number of Post Office wireless stations for internal communications. Direction finders have been installed at Lagos and Kano. There are sixteen aerodromes, Kano and Lagos being international airports.

**Religion.** The Muslim religion is widely diffused in the N. Region, notably among the Fulani and Hausa tribes who are of very long-standing historical antecedents. Paganism prevails in some parts. Protestant and Catholic missions have industrial schools at many stations, and in 1954 the number of Christians was estimated at 1,000,000. The small number is surprising in view of the fact that the W. coast of Africa has been in close contact with Europe for 3 cents. But Christian missionary effort did not make any great headway until the beginning of the present cent. It has met with conspicuous success in S. Nigeria where, unopposed by Mohammedanism, it has gone hand in hand with European education. Elsewhere Christianity suffers from a number of disabilities, compared with Islam. It is spread by Europeans, whose culture is poles apart from that of the African; Islam is spread among blacks by blacks. Christianity is presented in multitudinous forms; Islam is practically free from sectarianism and indeed constitutes one huge brotherhood.

**Education.** The federal gov. is responsible for education in Lagos. Elsewhere it is a regional responsibility. Since Jan. 1955 education has been free for all primary schoolchildren within the 6-12-year age group. At the end of 1955

there were about 1,277,000 children receiving primary education. There are 156 teacher training institutions having a capacity for 10,400 trainees. There are 162 secondary schools capable of holding 30,000 pupils; 1 technical institute; and 8 trade centres for 1630 apprentices. At the Univ. College, Ibadan, there are 511 undergraduates; 393 students were attending colleges of art, science, and technology at the end of 1955. Scholarships are awarded for studying overseas; more than 2000 Nigerians were said to be studying in the U.K. in 1954, and 300 in the U.S.A. The Nigerian Union of Teachers has a membership of 31,000, the largest of Nigeria's 177 trade unions.

**Health.** This is the responsibility of regional govts., the federal gov. being responsible for Lagos. Malaria, yellow fever, trypanosomiasis, cerebro-spinal meningitis, pneumonia, smallpox, leprosy, yaws, tuberculosis, dysentery, venereal diseases, intestinal parasites, filariasis, onchocerciasis, elephantiasis, and tropical ulcers are all prevalent. Leprosy is being tackled with outstanding success, and malaria is being progressively combated. There are 142 hospitals, 419 maternity centres, 9 rural health centres, and 1000 dispensaries. There are about 12,313 hospital beds, and expenditure on the health services in 1954-5 amounted to £4,135,000.

**History.** The N. part of Nigeria, although vaguely known to Arab geographers of the 14th cent. who were acquainted with the Negro kingdoms of the W. Sudan, remained unknown to Europe until, towards the end of the 18th cent., and in the first half of the 19th cent., explorations by Mungo Park, Clapperton, the Landers, Barth, and others revealed the true course of the Niger and the existence of organised states of the interior. These discoveries led to attempts to open the country to overseas commerce, and, despite very heavy mortality in the early years, trading posts were estab. on the banks of the Niger and the Benue. When the interior of Nigeria first became known to Europeans, the open country had been for some time the home of the Negroid and Berber peoples, who had adopted the Muslim religion and formed powerful and comparatively civilised states. In the forest and mt country, on the other hand, there dwelt many Negro tribes, the people of which were rude savages, addicted to cannibalism and human sacrifice. Of the origin of the Yorubas, numerically the most important tribe, who now occupy the country between Lagos on the S. and the Niger on the N. and are the predominant race throughout the provs. of Abeokuta, Igbu, Ondo, and Oyo, there is no definite knowledge. A tradition that they came from Egypt is suggested by certain bronze heads found at Ife and the manner in which the dead are bound for burial. However, their estab. in the W. of Africa was, it is generally stated, in consequence of their being driven by Yaa-rooba, son of Kahtan, out of Arabia to the W. coast between Ethio-

pia and Egypt, whence they advanced into the interior of Africa until they reached Yarba. The Alafin, ruler of Oyo, was left with little but the cap., and the Fulani from Ilorin came and sacked the tn. Soon afterwards the emir of Ilorin summoned the Alafin to Ilorin and compelled him to accept the doctrines of Islam, whereupon the Yoruba people resolved to drive out the Fulani and thereby avenge the insult to their titular head. The Fulani, however, inflicted on their forces a crushing defeat; Oyo was deserted, and the people fled before the victorious Fulani, who overran the country as far S. as Abeokuta.

The estab. of the early Hausa states must have taken place at a very remote era, but we have little documentary evidence of the early hist. of the Hausas, who to-day are spread over a large area of N. Nigeria, especially in the provs. of Sokoto, Kano, Zaria, and Bauchi. Before the spread of the Muslim creed the Hausas were pagans, but the new religion penetrated the country in the course of the 13th cent. and profoundly affected both the religious and social life of the Hausas. A form of government grew up based on Islamism, with a well-organised fiscal system and judiciary, and each state was ruled by a chief in a walled cap. to which people could flee from invaders. Though each Hausa state was independent, they seem to have been joined together at times in a loose confederation for purposes of defence. From the early years of the 16th cent. until the beginning of the 19th cent. there was a series of civil wars in Hausaland, and then there was a resurgence of the Fulani people under Othman dan Fodio. Othman was not only a warrior but also a devout Muslim and a scholar. When he succeeded in firmly establishing a Fulani empire, he retired to continue his studies. He handed over the administration to his brother Abdullahi and his son Bello. Othman d. in 1817. He was followed by Bello, whose reign was a troubled one, there being continual wars against tribes which refused to submit to Fulani hegemony; but, despite these wars, Bello found time to study and, like his father, wrote sev. works on hist., theology, and geography. He was visited by Clapperton at Wurno (1824) and sent a cordial message by Clapperton to William IV. The Fulani rulers certainly administered the Hausaland with ability and justice, and the fact that they were able to maintain their rule for a hundred years, a comparatively small number of aliens governing a numerous subject people, is evidence of their marked superiority among the W. African tribes. But as Othman's original famous 'flag-bearers' in the Jihad passed away, corruption crept in, the emirs slackened in their administration and lapsed into the habits of the pagans. Thus it was a diminished kingdom, from which the glory had departed, when the Brit. arrived at the end of the 19th cent.

Lagos was bought in 1861 from a native chief, in 1866 placed by letters patent

under the gov. of Sierra Leone and, later, administered as part of the Gold Coast colony until 1886, when a separate colony and protectorate of Lagos was founded. It is true that other European nationals had set up trading posts on the Niger as early as the 17th cent., but they were not interested in political development and were concerned exclusively with the slave trade, and indeed it was only after the abolition of this trade in the early years of last cent. that there was any appreciable advance in the commerce in commodities. Even so, Lagos had been bought chiefly to prevent its continued use as a slave market. Prior to the period commonly known as the 'scramble for Africa,' Brit. merchants came together in mutual defence against Fr. competition, under the leadership of Sir George Goldie (the 'founder of Nigeria'), as the United African Co., being granted a royal charter (1873). In 1885 the Brit. claim to a protectorate over Nigeria was recognised by the Berlin Conference, and that part of the country which was not included within the Lagos ters. or the sphere of the chartered company was placed under Foreign Office administration as the 'Oil Rivs. Protectorate,' later named the 'Niger Coast Protectorate.' By 1900 the chartered company had passed its period of usefulness and its charter was revoked. The N. part of its ters. became the N. Nigeria Protectorate and the S. was combined with the Niger Coast Protectorate as the protectorate of S. Nigeria, and both were placed under the Colonial Office. In 1906 the colony of Lagos and its protected ters. were combined with the protectorate of S. Nigeria and designated the colony and protectorate of S. Nigeria, with Lagos as the seat of gov. In 1914, the N. and S. protectorates were amalgamated to form the colony and protectorate of Nigeria. Until 1900 the chartered company had been responsible for both the civil administration and commercial development, but it never succeeded in extending its administration over the whole of Nigeria, though its influence was felt along the main trade routes on the rivs. Even after the transfer of gov. to the Crown much remained to be done in the pacification of the country, a work which owed much to Lord Lugard and the late Sir Hugh Clifford; and it was not until after 1900 that the phase of internal economic development could begin. Yet, as Lord Hailey justly observes, 'the fact remains that for a capital outlay of about £1,000,000 the largest Brit. colony in Africa was added to the Crown.' See also BENIN; BENUE; BORNU; FULAH; HAUSA; KANO; LAGOS; NIGER; NUPE; SOKOTO.

See S. Gwynn, *Sir George Goldie, Founder of Nigeria*, 1934; M. Perham, *Native Administration in Nigeria*, 1937; A. N. Cook, *British Enterprise in Nigeria*, 1943; *Nigeria Handbook*, Crown Agents, 1953; *Nigerian Constitution Report* (Cmd. 8934), H.M.S.O., 1953; *The Economic Development of Nigeria*, Lagos, 1954; A. C. Burns, *History of Nigeria*, 1956;

*Annual Report on Nigeria*, H.M.S.O.; Lord Hailey, *An African Survey* (revised ed.), 1957.

Night, see DAY.

Night-blindness, see NYCTALOPIA.

Night-blooming, or Noctiflorous, Plants, plants which have adapted themselves so as to gain the fertilising services of moths and a few other nocturnal insects. All are strongly scented, and on that account are valued in the garden. Most of these plants bear showy white flowers, and those that are tinted yellow, pink, or blue are of such a texture that they are conspicuous in the lighter hours of the summer night. A common instance amongst native plants is the bladder campion, *Silene cucubalus*. The tobacco plants (*Nicotiana*) partially close their flowers in the daytime, opening at about 6 p.m., and emitting a penetrating, very sweet odour. In some plants the flowers last for a number of nights, but others open and fall in one night. Other familiar garden noctiflors are the jasmines, the tree of sadness, the marvel of Peru, the night-blooming cactus, the night-scented stock, dame's violet, and the evening primrose, none of which are natives of Britain.

Night Heron or *Nycticorax*, genus of birds of the family Ardeidae of very wide distribution. They are most active at night. Of about 9 species, *N. griseus* alone visits Britain. The bird is 23 in. long, and its plumage is beautifully coloured, the back being greenish-olive and the breast wine colour; long white plumes are borne on the head.

Nighthawk, another name for the Brit. nightjar. Also the best-known species (*Chordeiles virginianus* or *C. popelue*) of Chordiles, a genus *Caprimulgus* (goatsucker). It is the nighthawk of N. America and has a wide range from Canada to Brazil. See GOATSUCKER.

Nightingale, Florence (1820-1910), reformer of hospital nursing, b. Florence. While quite young she did much philanthropic and social work in England, and in 1844 visited many hospitals and reformatories in Europe. In 1851 she trained as a nurse at an institution of the Protestant Deaconesses at Kaiserswerth, on the Rhine, and on her return to England devoted herself to the Governesses' Sanatorium in connection with the London Institute. At the beginning of the Crimean War the wounded soldiers suffered so terribly from the inefficiency of the nursing dept that Florence N. volunteered her services and sailed in 1854 with a party of 38 nurses, including Sisters of Mercy from England and Ireland. An interesting sidelight on her work in the Crimea is afforded by her letter from Balaclava Hospital to Mother Clare Moore of Bermondsey: 'Your going home is the greatest blow I have had yet. But God's blessing and my love and gratitude go with you as you will know.... You were far above me in fitness for the general Superintendency both in worldly talent of administration and far more in the spiritual qualification which God values in a Superior. My being placed over you

in our unenviable reign of the East was my misfortune and not my fault.' Her self-sacrificing services to the wounded made her name famous throughout Europe. She wrote sev. pamphlets on nursing and hospitals, and a fund, the interest on which amounts to about £1600 per annum, was raised in 1857 for the purpose of training nurses, now carried out at St Thomas's and King's College Hospitals. She received the Order of Merit in 1907. The Verney-N. papers afford interesting details of her relationships with Benjamin Jowett (who wanted to marry her), Richard Monckton Milnes (also a great admirer), Sidney Herbert, and the poet Arthur Hugh Clough, both also intimate friends. See lives by Miss Tooley, 1904; Sir E. T. Cook, 1913; R. Nash and A. Short, 1925; G. C. Willis, 1931; C. Woodham-Smith, 1950; also L. Strachey, *Eminent Victorians*, 1918.



DEADLY NIGHTSHADE

**Nightingale** (*Luscinia megarhynchos*), most famous of the warblers, or indeed of any song-birds. The male bird arrives from N. Africa, in the middle of April, a few days before the female, going almost invariably to the woods and copses which have always been the haunts of its species; but the distribution is very local, being confined to the S. and Midland cos., though sometimes found in the W. The Nightingale's song on a calm night in May or June has a perfect setting; but it is impossible to exaggerate the beauty of its song, which is unique in its variety and sustained melody. Contrary to the popular idea, the song can be heard by day as well as at night-time. The nest is made often on the ground, of dry grass and leaves, and in it are laid 4 to 6 olive-green eggs. The male's song continues until the young are hatched. The female is slightly smaller than the male, but exhibits no definite distinction of plumage. The upper parts are chestnut-brown; the long rounded tail is reddish-brown, and the breast is dull greyish-white, tinting to brown. The food is mainly composed of caterpillars, other insects, and small

worms; but fruit is sometimes eaten. The winter migration is begun as early as July, and is completed before the end of Aug. Nightingales are sometimes kept in captivity, but need much careful management. *L. philomela*, the thrush nightingale of E. Europe, is a louder but not such a sweet songster. The Persian nightingale (*L. hafsi*) is said to be the bulb of the poets.

**Nightjar**, see GOATSUCKER.

**Nightmare**, see DREAM and FREUD.

**Nightshade**, name given especially to a number of plants of the family Solanaceae. The deadly *N. (Atropa belladonna)*, q.v.) is the most dangerous of Brit. poisonous plants. Every part of the plant has the poisonous principle, atropin (q.v.). The woody *N. is Solanum dulcamara* and the Black *N. is Solanum nigrum*, both poisonous. See SOLANUM and BITTERSWEET. Enchanter's *N. is Circaea* (q.v.).

**Nigri Sembilan**, see NEGRI SEMBILAN.

**Nigritia**, see NIGERIA and SUDAN.

**Nihilism** (Lat. *nihil*, nothing) as a philosophical term dates from the 12th cent., and may be said to signify that sceptical attitude of mind which denies everything, even existence. In more modern times, however, *N.* came to stand for an amorphous body of social and political discontent which manifested itself among the Russian educ. classes. Its currency in Russian intellectual circles owed much to Turgenev's famous novel, *Fathers and Sons*, where the chief protagonist of the creed recognises no authority, doubts every general principle and value, and asserts the freedom of the sovereign individual. *N.* was essentially a philosophical and literary school without any political action of its own. However, from the fact that in so far as it was given a political direction it aimed at a reconstruction of society on a communistic basis; and as, in order to attain that end, Nihilists did not scruple to use the most violent means (their most prominent victim was the Tsar Alexander II, who was assassinated on 13 Mar. 1881), *N.*, in the popular mind, became a synonym for anarchism (q.v.). But the great bulk of Nihilists in Russia took no part whatever in the political struggle, and were content to devote their energies to such matters as education, the raising of the status of women, etc., and to making known their ideals through the channels of literature and art. During the last decade or two prior to the First World War, the term *N.* became more and more obsolescent, for the politically minded reformers had become identified with definite political creeds and parties. See also RUSSIA, History. See J. B. Hopkins, *Nihilism*, 1881; K. Oldenburg, *Der russische Nihilismus von seinen Anfängen bis zur Gegenwart*, 1888; Prince P. Kropotkin, *Memoirs of a Revolutionary*, 1899, and *The Terror in Russia*, 1911; H. E. Read, *The Philosophy of Anarchism*, 1940; E. von Schenck, *Europa vor der deutschen Frage*, 1946; A. Weber (trans. R. F. C. Hull), *Farwell to European History: or, the Conquest of Nihilism*, 1947.

**Nihon**, see NIPPON.

**Niigata**, seaport city of Niigataken, Japan, 160 m. NW. of Tokyo. It is an important centre of rice production and general commerce. Seat of the prefectural gov., it also has steel, machine-tool, locomotive, and paper industries, and there is trade with Siberian ports. The production of petroleum has been developed, and there is a large manuf. of chemicals. Pop. 262,000.

**Nijar**, Sp. tn in the prov. of Almería, in the Sierra Alhamilla. It has a trade in cereals, fruit, olives, and esparto. There are iron, lead, and manganese mines near by. Pop. 13,400.

**Nijinsky, Vasilav** (1890-1950), Russian ballet dancer and choreographer. His family, of Polish origin, had been dancers for many generations. He was b. at Kiev and at the age of 10 entered the Imperial School of Ballet as a student under Nicolai Legat. His extraordinary talent soon became evident, and in May 1908 he graduated as a member of the Imperial Ballet, making his début at the Mariinsky Theatre in the ballet of Mozart's *Don Giovanni*. Two years later he resigned because, it is believed, the propriety of his costume in *Giiselle* was questioned. By this time, however, he had won a European reputation with his creation of the part, among others, of the Egyptian slave in Bakst's *Schéhérazaade* and of Harlequin in Fokine's *Carnaval* during the seasons of Russian ballet organised in Paris by Diaghilev in 1909 and 1910. Early in 1911 he left Russia with the independent company which Diaghilev formed with H.Q. in Monte Carlo. During the seasons held there and at Paris, Rome, Berlin, and London over the next 2 years N. added to his triumphs—particularly in Fokine's ballets, *Le Spectre de la Rose* and *Petrouchka*, in which there was scope not only for N.'s genius as a dancer but also his great dramatic ability. In 1913 N. succeeded Fokine as *maitre de ballet*, and in *L'Après-midi d'un faune*, *Jeux*, and *Le Sacre du printemps* he created a new non-classical style of dancing, violently controversial at the time. In Aug. of that year he went to S. America with the Ballets-Russes and on arrival at Buenos Aires he married Romola de Pulasky, a member of the company, the daughter of an aristocratic Hungarian family. The marriage caused a break with Diaghilev, and N. endeavoured to maintain a London season with his own company. He was entirely unsuited to the administrative work involved and his health broke down. On the outbreak of the First World War he, his wife, and daughter Kyra were interned in Hungary, but in 1915 he was allowed to go to the U.S.A., where he again joined the Ballets-Russes. His new ballet *Till Eulenspiegel* to music by Strauss was produced in New York in 1916 but was ineffectual. The Amer. tour was followed by a short season in Madrid and Barcelona at the invitation of Diaghilev. A S. Amer. tour undertaken by N. in the summer of 1917 proved a failure and was the end of his association with the Ballets-Russes. He retired to St Moritz. His mental instability, noticeable even in the earlier

years when he was devoted to his art almost to the exclusion of normal adult responsibility, now became more evident, and from 1918 until his death in London he was able to take no further active part in ballet. He was the greatest of male dancers, the role of whom he revolutionised. His technique, interpretation, and characterisation amounted to genius, and were combined with wonderful lightness of movement. It is said that he defied the law of gravity, appearing to descend through the air more slowly than he rose. See also **BALLET**. See Romola Nijinsky, *Nijinsky*, 1933, and C. W. Beaumont, *Vaslav Nijinsky* (2nd ed.), 1943.

**Nijmegen**, Nimeguen, or Nimwegen, tn in the prov. of Gelderland, Netherlands, on the R. Waal. It was formerly the residence of the Carolingian emperors, and the beautiful park called the Valkhof occupies the site of the old palace. Another interesting feature of the tn is the church of St Stephen, which was originally built in 1272, and contains a monument of Catherine of Bourbon (d. 1469). There is a Rom. Catholic univ. at Nijmegen, estab. in 1923. There are extensive manufs. of beer, Prussian blue, and leather, as well as of pottery, cigars, and gold and silver work.

Nijmegen figured prominently in the Anglo-Amer. operations on the W. front in Sept. 1944, being involved in the plan to acquire flanking bridgeheads across the lower Rhine beyond the main fortifications of the Siegfried line (q.v.) in the hope of quickly turning the Ger. N. flank and so ending the war earlier than might have been expected. This operation to seize the lower Rhine bridges comprised an airborne operation to capture the vital bridges over the Maas, Waal, and lower Rhine at Grave, Nijmegen, and Arnhem and a land operation, on a very narrow front with a one-road communication most of the way, to advance through Eindhoven and Nijmegen. The Brit. 1st Airborne Div. was dropped furthest N. in the Arnhem area, the U.S. 101st Airborne Div. N. of Eindhoven, and the U.S. 82nd Airborne Div. in the Nijmegen area (17 Sept.). In the next few days there was much confused and heavy fighting between Nijmegen and Arnhem. Repeated Ger. attacks against the thin allied line of communications necessitated the temporary withdrawal of armour from Nijmegen to keep the single road open; but gradually, as the line was strengthened, a firm front was estab. along the Waal and Maas (for further details see **under** **WESTERN FRONT in SECOND WORLD WAR**). Nearly the whole shopping area of Nijmegen was destroyed by bombing and shelling; but extensive rebuilding has since been carried out. A new double-track road has been constructed between Nijmegen and Arnhem. Pop. (1957) 121,470.

**Nijni-Tagil**, see **NIZHNIY TAGIL**.

**Nika Riot**, insurrection at Constantinople during the reign of Justinian I, AD 532. It started in the hippodrome (q.v.) as a clash between the sporting factions, which had for long formed the basis of political cabals. Discontent had been

fanned into flame by burdensome taxation, and the outburst was of unparalleled violence. The imperial palace was attacked; Justinian would undoubtedly have lost his throne, and probably his life, but for the courage of the empress, Theodora, who refused to leave the city. It is said that 30,000 people were killed before the rebellion was finally crushed by Belisarius (q.v.).

**Nike**, Gk goddess of victory, daughter of the giant Pallas and Styx, by whom she was sent to fight for Zeus against the Titans. She is generally represented as winged, and with a wreath and a palm branch. As herald of victory she also has the caduceus (see DIVINING ROD). In the 5th cent. BC a temple was built in honour of N.-Apteros (unwinged) at Athens. Her Rom. equivalent was Victoria.



THE TEMPLE OF NIKE-APTEROS,  
ATHENS

**Nikko**, city of Tochigiken, Japan, noted for its Toshogu shrine and the scenic beauty of the neighbourhood. The shrine is the mausoleum of Ieyasu, founder of the Tokugawa Shogunate gov., and was built by the third Shogun Iemitsu in 1654. N. has a large copper and aluminium industry, although tourism is the biggest source of the city's income. Pop. 33,000.

**Nikolas of Cusa**, see CUSA.

**Nikolayev** (Ukrainian Mykolaiyiv): 1. Oblast in S. Ukraine in the Black Sea lowland steppe, traversed by the S. Bug. Wheat, sunflowers, and cotton are grown, and there are market gardening and dairy farming. It has large engineering and food industries. N. was practically unpopulated until annexed by Russia from Turkey, 1774-91. Pop. 1,000,000, Ukrainians and Russians (before the war also Jews and Germans).

2. Cap., economic and cultural centre of the above, at the S. Bug estuary. It is a major industrial centre with large shipyards, agric. engineering, and food and light industries. It is also one of the chief Black Sea ports. N. was founded in 1788

as a centre of shipbuilding and naval base on the Black Sea; it has been prov. cap. since 1802, a commercial port since 1862, and has had large scale industry since 1895. Pop. (1956) 206,000 (c. 1914, 120,000; 1923, 81,000; 1939, 167,000), Russians and Ukrainians.

**Nikolayevsk-na-Amure**, seaport in the Khabarovsk Kray of the Russian Far E., on the Amur near its mouth. It is the centre of an important fishing and gold-mining area, with a school of navigation (since the 1850's) and a teachers' training school for the peoples of the Russian Far E. It was founded in 1850 as a naval base and was cap. (until 1880) of the Russian Pacific ters. It was occupied by the Japanese, 1918-22. N. was cap. of the Lower Amur oblast within Khabarovsk Kray, 1934-56 (abolished). Pop. (1926) 7400 (c. 1914, 16,500).

**Nikolsburg**, see MIKULOV.

**Nikol'sk-Ussuriyskiy**, see VOROSHILOV.

**Nikon** (1605-81), Patriarch of Moscow, 1652-8, a Mordvin (see MORDVIA) by origin. He introduced sev. reforms (correction of books used in church services, unification of the ritual, etc.) which were rejected by a part of the clergy and of the laymen (the Old Ritualists or Old Believers), thus causing the schism in the Russian Church. N.'s attempt to put the authority of the Church above that of the State led to a conflict with the tsar Alexis Mikhaylovich (q.v.). Defeated in this struggle N. was condemned by the Church council, 1666-7, attended by E. patriarchs, and confined to a monastery.

**Nikopol'**, tn in the Dnepropetrovsk oblast of the Ukraine, on the Dnieper, 70 m. SW. of Dnepropetrovsk. It is a major centre of metallurgy and engineering, the centre of a rich manganese mining area, and a riv. port. It was founded in the 18th cent. on the site of the destroyed Zaporozh'ye Sich (see SICH); it became a tn in 1782. Pop. (1956) 84,000.

**Nikopol** (ancient Nicopolis), tn of Bulgaria, in Pleven (q.v.) prov., on the r. b. of the Danube (q.v.), opposite Turnu-Măgurele in Rumania, 23 m. NE. of Pleven. Sigismund (q.v.) of Hungary was defeated here in 1396 by the Turks under Bajazet I (q.v.). The tn was burnt by the Russians in 1877. There is a riv. port and an agric. market. Pop. 6000.

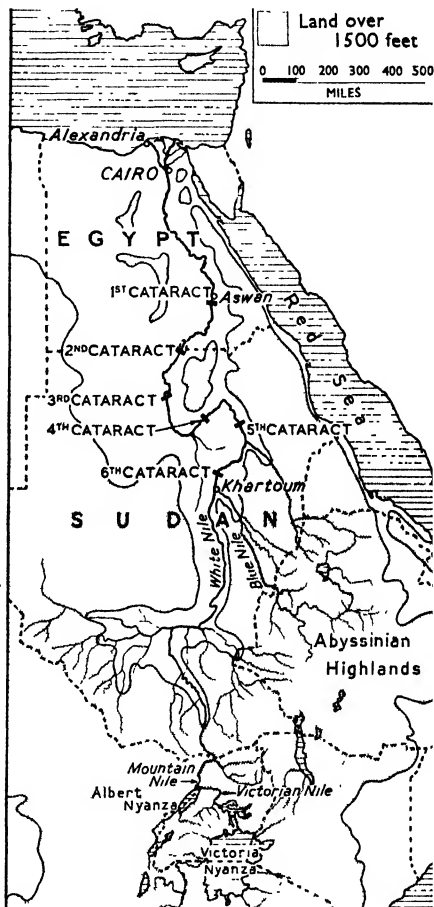
**Nile** (from the Semitic *nihal*, a riv.), longest and most important river of Africa; its source is in the vast lake of Victoria Nyanza, which stands at an altitude of 3900 ft above sea level. None of the rivs. which flow into this lake is sufficiently large, in relation to the size of the lake, to be a source riv. The chief trib. is the Kagera, the length of which, from the source to Victoria Nyanza, is 530 m. The Nile leaves the Victoria Nyanza at its N. extremity, and flows in a NW. direction, passing through the Ibrahim and Kioga Lakes. The riv. leaves the central African highlands at Fauvera and turns westward, being known now as the Somerset Nile. Between Fauvera and the Albert Nyanza the riv. falls at least 1000 ft, with many cataracts, such as the



Murchison Falls (118 ft). After leaving this lake, and receiving as a trib. the Sem-like Nile from Albert Edward Nyanza, the riv. begins its northerly course and soon flows through the plains of the E. Sudan. It is now navigable, and is in character like a riv. of the lowlands, having a sinuous course. The main riv. is split up into sev. channels; at  $7^{\circ} 30' N.$  the 2 main arms are the Bahr-el-Jebel and the Bahr-el-Seraf, which join again about  $9^{\circ} 30' N.$  The Bahr-el-Ghazal here flows into the main stream, and deflects it for a short distance to the E., but when the Sobat joins it the course once more turns northwards. From Fashoda to Khartoum the riv. is known as the White Nile (Bahr-el-Abiad), and the name 'Nile' simply is given to it only after the junction with the Blue Nile (Bahr-el-Azrek), which joins it at Khartoum, flowing from the Abyssinian tablelands. The Atbara is the last trib., which joins the Nile at a point 200 m. below Khartoum, and is a large riv. in the rainy season, though greatly reduced in the dry. The Libyan and the Red Sea plateaus, which approach the riv. in succession, are the cause of its sinuous course in Nubia. Between  $16^{\circ}$  and  $24^{\circ} N.$  lat. there are 6 groups of cataracts, the largest being at Wadi Halfa. From the junction of the Atbara to the sea the Nile does not receive a single trib., the lower basin being hence very small in area, varying in width from 1 to 12 m., that is to say, the region over which the annual inundations of the riv. extend. This region increases from less than 1 m. in Nubia to as much as 12 m. in Upper Egypt, and it is the extent of the inundation which determines the prosperity of the country during the ensuing season. N. of Cairo the delta of the Nile, which has a width of 120 m. and an area of 8500 sq. m., commences, with many canals, lakes, etc. The most important branches are the Dumietta and the Rosetta, each having a length of 146 m.

Irrigation was begun by Mohammed Ali; in 1842 he called in Mougel Bey, a Frenchman, who built the Cairo barrage. Water was conducted to the land by irrigation canals, but the control of the water robbed the land of silt, and its productivity decreased. Bey's barrage was used until 1883, when Brit. engineers rebuilt it, increasing the depth of water so that it travelled down the irrigation canals with increased velocity and carried the silt with it. The Aswân (Assuan) dam, which was begun in 1895 and finished in 1902, was heightened in 1912. From Dec. to Mar. the sluices are closed and the waters held until the maximum capacity of  $2\frac{1}{2}$  milliards of cubic metres is reached. Before Mar. and July the

water is drawn off into the irrigation canals. S. of Aswân for 200 m. the riv. is one large reservoir. Above the Aswân dam is a barrage at Esna, made by placing suitable booms at an angle of  $45^{\circ}$  to the stream, and there is another barrage at



THE RIVER NILE

Assiut. Assiut dam gave new life to an irrigation system which was 3000 years old. A dam at Sennar, 170 m. S. of Khartoum, has been constructed to hold up the waters of the Blue Nile. It was finished in 1925, and is nearly 2 m. long. The Aswân reservoir holds 5,500,000,000 cubic metres of water, and the Gebel Aulia reservoir (completed in 1937)

2,000,000,000 cubic metres. New barrages have been constructed at the bifurcation of the Nile below Cairo to replace the existing structures which, having been built in 1861, were unable to meet the conditions following the increase in summer supplies, the reclamation of considerable waste lands, and the earlier watering of food crops. The Mahmudik Canal, which connects the Rosetta with the Alexandria Nile, is of great commercial importance. At high water there is continuous communication between Fort Berkeley and the sea, a distance of 2900 m., but in periods of low water the cataracts impede the navigation. All the year round navigation is possible between Khartoum and Fort Berkeley (1090 m.), and also from the sea as far as Mansura (60 m.) on the Damietta, and as far as Kafr-el-Zayuh (70 m.) on the Rosetta branch. The ann. rise of the middle and lower Nile is due to the periodical rains of Ethiopia (q.v.) and equatorial Africa. The White Nile constitutes a more uniform source of supply, whilst the Blue Nile and the Atbara, when swollen by 3 months' rain, cause the inundating floods. A series of new projects has been formulated to bring the Nile under control so that every possible cubic foot of its water will be utilisable. The principle of the projects is 'century' or continuous storage, enabling the maximum supply in abundant years to be conserved for lean years. The first of the new projects is the Owen Falls (q.v.) dam on Lake Victoria, the object being not only to utilise to the greatest possible degree the waters of the White and Blue Niles and their tribs., but also to safeguard against flooding and its concomitant famine. At present much water goes to waste, for excess supply from years of plenty cannot be stored. Yet in low years all the water that can be stored from the flood still falls short of normal crop requirements. Even if its size permitted, excess water could not be stored in a reservoir like Aswân because of evaporation losses. Adequate storage is possible only in the great lakes of central Africa—Victoria, Albert, Kioga, and Tana. On these lakes evaporation and rainfall are nearly equal and, in fact, rainfall may exceed evaporation. In the great lakes a far greater vol. of water could be stored without much increase in surface area, and therefore in evaporation, an important consideration when a reservoir may be held at high levels for many years. The White Nile's capacity is, however, limited by the swamps of the Sudd, N. of Mongalla. In these swamps a high proportion of the flow is lost through evaporation and plant transpiration, so that out of 100 cub. ft. leaving Mongalla, only 62 reaches Aswân. It is therefore planned to cut a by-pass canal, the Jonglei diversion, round the swamps. Its size will depend on the discharge, and the velocity of the water must be sufficient to prevent the growth of weeds and papyrus. Lakes Victoria and Tana are to be the main reservoirs, Lakes Albert and Kioga being used as regulators. At present about 6,000,000 feddans (or ac.) are

irrigated in Egypt, and less than 500,000 in the Sudan. The new projects would supply enough water for 7,000,000 feddans in Egypt and 2,000,000 in the Sudan. The whole scheme may take 20 to 25 years, and it may be as long as 20 years more if there are a succession of bad years before the Victoria reservoir fills. The Nile has the longest basin of any riv., although the area of that basin (1,107,227 sq. m.) is surpassed by those of the Amazon and Mississippi; the length from the outlet at the Victoria Nyanza is 3473 m. Considering the great importance of the Nile to Egypt, it is not surprising that in ancient times it was deified, and it has always been regarded with the utmost reverence. Each year the Nile floods its banks and the height of the flood has been recorded annually since at least 3600 BC. It was not until the latter half of the 19th cent. that the question of the source of the Nile was finally settled, Sir J. H. Speke discovering the Victoria Nyanza in 1858; Bruce had in 1770 discovered the source of the Blue Nile.

See Sir S. W. Baker, *Nile Tributaries of Abyssinia*, 1880; Sir H. Johnston, *The Nile Quest*, 1903; W. E. Garstin, *Report upon the Basin of the Upper Nile*, 1904; H. G. Lyons, *Physiography of the Nile and its Basin*, 1906; J. H. Speke, *Discovery of the Source of the Nile*, 1908; Sir W. Willcocks and J. I. Craig, *Egyptian Irrigation*, 1913; A. Moret, *Le Nil et la civilisation égyptienne*, 1926; E. Ludwig, *The Nile* (Eng. trans., 1940); H. E. Hurst and R. P. Black, *The Nile Basin*, 1945; H. E. Hurst, *The Nile*, 1952.

Nile, *Battle of* (the 1798), see ABOUKIR.

Nile, *Blue*, see BAHR-EL-AZREK.

Nile, *White*, see BAHR-EL-ABIAD.

Nile Province (now Northern Province), prov. of Uganda, comprising the dists. of Karamoja, Langko, Acholi, and W. Nile. The soil is fertile, and coffee, cotton, and indigo are grown; there are rubber and ebony trees.

Niles, city in NE. Ohio, U.S.A., on the Mahoning R., 8 m. NW. of Youngstown. The chief industries are the manuf. of iron and steel, railway cars, and chemicals. Pop. 16,800.

Nilgai, see NYLGHAU.

Nilgiri Hills (Blue Mts), plateau in India in Madras state, with a general elevation of 6500 ft, the highest peak being Doddabetta (8760 ft). The climate is healthy and invigorating and the whole area is popular as a hot weather resort. The prin. hill stations are Ootacamund, formerly the summer H.Q. of the Madras Gov., Coonoor, Kotagiri, and Wellington. The hills are inhabited by a curious, primitive race, the Todas, who live in bee-hive-shaped huts and devote themselves mostly to grazing buffaloes.

Nilo-Hamites, group of Negro peoples living in Kenya, Uganda, Tanganyika, and S. Sudan and speaking languages which show Hamitic influence on an original Negro base. Although dark in colour their features show a marked non-Negro element. They are divided into 3 divs.: the Northern N.-H. (Bari, Kakwa, Lokoya, Lotuko, etc., of Sudan), Central

N.-H. (Karamojong, Jie, Toposa, Didinga, Turkana, etc., of Uganda and Kenya), and S. N.-H. (Nandi, Suk, Kipsigis, Masai, etc., of Kenya and Tanganyika). Most of these tribes are cattle keepers, and none has kings or powerful chiefs, tribal organisation being based on clan and age-set systems, in which initiation by circumcision plays an important part. See also NEGROES; HAMITES; MASAI. See C. G. Seligman, *The Races of Africa*, 1939; G. W. B. Huntingford, *The Northern Nilo-Hamites and The Southern Nilo-Hamites*, 1953; P. and P. H. Gulliver, *The Central Nilo-Hamites*, 1953.

**Nilometer** is, as its name indicates, an arrangement for measuring the height of the Nile in Egypt. There were sev. such arrangements in ant. times, as the height of the riv. was then, as now, the factor which determined the country's measure of prosperity for the year.

**Nilotes**, group of African Negro peoples speaking Nilotic languages and inhabiting the S. Sudan, parts of Uganda, and W. Kenya) and the Nuer-Dinka (Nuer and divs.: the Shilluk-Luo (Shilluk, Luo, Burun, and Anuak of Sudan; Lango, Acholi, Alur of Uganda; and Luo of Kenya) and the Nuer-Dinka (Nuer and Dinka of Sudan). Physically they are tall and very dark skinned, and linguistically show signs of early Hamitic influence on a basic Negro stock. The Shilluk and Anuak have a Divine Kingship, most of the other tribes having a clan-based organisation without kings or powerful chiefs. The best known are Nuer and Shilluk. See also NEGROES; SHILLUK; NUER; DINKA; HAMITES. See A. Butt, *The Nilotes of the Anglo-Egyptian Sudan and Uganda*, 1952, and C. G. Seligman, *Pagan Tribes of the Nilotic Sudan*, 1932.

**Nilotic Languages**, see NEGRO-AFRICAN LANGUAGES.

**Nilsson, Nils Martin Persson** (1874- ), Swedish archaeologist, educ. at Lund, Basel, and Berlin Univs. Lecturer in Greek (1900) and prof. of classical archaeology and ant. hist. from 1910 to 1939 at Lund Univ.; he is now emeritus prof. there. N. has written many works on archaeology and ant. Greece, including *A History of Greek Religion*, 1925, *The Minoan-Mycenaean Religion and its Survival in Greek Religion*, 1927, *Mycenaean Origin of Greek Mythology*, 1932, *Homer and Mycenae*, 1933, *Greek Popular Religion*, 1940, and *Greek Piety*, 1948.

**Nimbura**, see NYMBURA.

**Nimbus**, see CLOUD. For the meaning of the word in art see AUREOLE.

**Nimeguen**, see NIJMEGEN.

**Nimes** (formerly Nismes, ant. Nemausus), Fr. tn, cap. of the dept. of Gard. Founded by Augustus (q.v.), it became one of the finest cities of the Rom. Empire, but was ruined in the barbarian invasions. It was the scene of much strife during the religious wars of the 16th and 17th cents., and its growing industrial prosperity suffered from the revocation of the Edict of Nantes (q.v.). It is celebrated for its Rom. remains, chief among which are the amphitheatre (converted into a fortress in the Middle Ages); the Maison C rée, a

temple in the style of the Parthenon; the temple of Diana; the Tour Magne, still 92 ft high; 2 Rom. gates and the aqueduct of the Pont du Gard (q.v.). It is the seat of a bishopric. Nicot, Guizot, and A. Daudet (qq.v.) were b. here. Silks, carpets, footwear, brandy, and machinery are manuf., and there is a trade in wines, grain, groceries, and colonial produce. Pop. 89,150. See E. Espérandieu, *Le Pont du Gard et l'aqueduc de Nîmes*, 1926, and *La Maison Carrée à Nîmes*, 1929.

**Nimitz, Chester William** (1885- ), Amer. admiral, b. Fredericksburg, Texas, U.S.A., son of Chester Bernhard N. Graduating from the U.S. Naval Academy, 1905, he became ensign in the U.S. Navy in 1907. Having sev. years' experience as a submarine officer before the First World War, N. was lieutenant-commander of the Atlantic submarine flotilla, 1916, and, in 1918, chief of staff to the commander of the Atlantic fleet's submarine force. From 1933 to 1935 he was commanding officer of the U.S.S. *Augusta*. Promoted to rear-admiral in June 1938, he was chief of the bureau of navigation in the Navy Dept. 1939-41. On 17 Dec. 1941, following the Jap. attack on Pearl Harbour, the naval high command was overhauled and N. became commander-in-chief of the Pacific fleet, with the rank of admiral. N. then reorganised his fighting groups and strategy, selecting as leaders Halsey, Mitscher, Kincaid, Spruance, and Turner. He was responsible for the reconquest of the Solomon Is. in 1942-3, of the Gilbert Is. in 1943, and of the Marianas and Marshalls in 1944. With the withdrawal of the Jap. fleet to the inner seas there was a regrouping of the Amer. naval forces in the Pacific. Gen. MacArthur was given the Seventh Fleet as part of his command; Adm. Halsey was assigned to the Central Pacific as commander of the Third Fleet, which, with the Fifth Fleet under Adm. Spruance, was put under the supreme direction of Adm. N. MacArthur invaded Leyte, aided by immense naval forces sent to his support by N. N. directed the initial stages of the invasion of Okinawa (1945). (See PACIFIC CAMPAIGNS, or FAR EASTERN FRONT, in SECOND WORLD WAR.) In Dec. 1945 he was promoted to the 5-star rank of fleet admiral of the U.S. Navy. N. was chief of naval operations from 1945 to 1947; special assistant to the secretary of navy from 1947; named chairman of the Presidential Committee on Internal Security and Individual Rights. In common with most distinguished naval officers N. is opposed to the merger of the armed services. In Mar. 1949 he was appointed by the U.N. as administrator for the plebiscite in Jammu and Kashmir (q.v.) in conformity with the terms of the last interim report of the U.N. Commission for India and Pakistan.

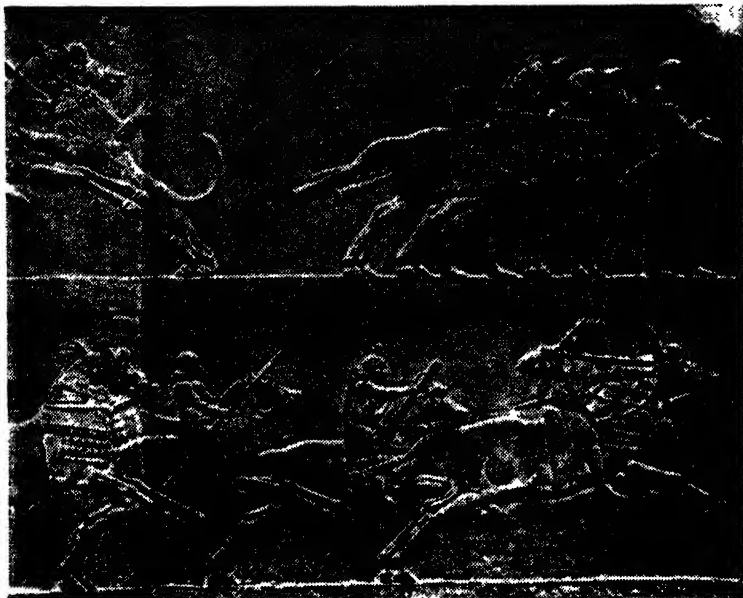
**Nimonic**, see NICKEL.

**Nimonic Alloys**, nickel base alloys containing 20 per cent chromium and hardened with small additions of aluminium, titanium, and iron. Sometimes part of the nickel is replaced by 18 per cent cobalt. As these alloys are strong at high temps. and resist oxidation they are used

extensively in the manuf. of jet and gas turbine engines. See ALLOY.

**Nimrod** (Gen. x. 8-11; 1 Chron. i. 10; Micah v. 10), son of Cush, i.e. perhaps the Kassites, who conquered Babylonia (the land of Shinar) in the second millennium BC. Nothing is known of this legendary figure, though his name survives (probably under scriptural influence) attached to one of the 4 cities he is said to have founded in Assyria, viz. Calah on the Tigris (24 m. S. of Nineveh) which is now called Nimrud, and in Birs Nimrud, near Babylon. He is

an earlier vil. site by Shalmaneser I c. 1200 BC; rebuilt by Ashurnasirpal II in 879 BC; fl. until c. 640 BC, and was destroyed by the Medes in 612 BC. Xenophon called Nimrud Larissa. Fine collections of bronzes of the period of Sargon II, and Phoenician ivories found by Loftus, have been supplemented by the recent excavations of the Brit. School of Archaeology in Iraq (under Mallowan) which in 1949-58 found additional palaces, inscriptions, and large ivories. See also ASSYRIA. See A. H. Layard, *Nineveh and its Remains*,



British Museum

LION HUNT; RELIEF FROM ASHURBANIPAL'S PALACE AT NINEVEH

said to have been a 'mighty hunter before the Lord.' The meaning of the latter phrase is disputed. It may mean 'in heaven,' which would make N. a deified figure, like Orion with a constellation named after him. He has been identified with Ninurta, the god of war (who in turn has been identified (1) with Gilgamesh (q.v.), solar hero of a great epic, who was a deified king of the first dynasty of Erech, or (2) with Lugabanda). Modern scholars equate N. with Marduk (q.v.).

**Nimrod**, see APPERLEY, CHARLES JAMES. **Nimrud**, the biblical Calah, anct Assyrian military cap. Kalkhu. The citadel by the R. Tigris 24 m. S. of Mosul, Iraq, was excavated after 1847 by Layard, Rassam, and Rawlinson. Prin. discoveries were the sculptured reliefs of human-headed winged bulls now in the Brit. Museum. The city was founded on

1849, and M. E. L. Mallowan, *Twenty-five Years of Mesopotamian Discovery*, 1956.

**Nimwegen**, see NIJMEGEN.

**Nine-power Agreement**, treaty made in 1923 between Great Britain, the U.S.A., France, Belgium, Italy, Holland, Portugal, China, and Japan, to guarantee the sovereign independence and territorial and administrative integrity of China. Japan violated the treaty in 1931 by occupying Manchuria and by starting a large-scale war in China in 1937. In that year the treaty was invoked and a conference of the signatories was held at Brussels (Nov.), but to no purpose.

**Nineteen Thirty-nine-Forty-five Star**, see STAR (decoration).

**Nineveh**, a cap. of anct Assyria. According to all accounts it was a city of size, strength, and magnificence. The anct city is represented by 2 large mounds

known as Kuyunjik and Nebi Yunus ('Prophet Jonah': the site of the reputed tomb of the prophet Jonah), situated on the E. bank of the Tigris, opposite the modern city of Mosul. In the Neolithic period a small vil. existed there. During the first 3 cents. of the Assyrian Empire, N. was a poor place. Sharrukin (or Sargon) II (721-705 BC) had made his cap. successively at Ashur, Calah, and N., and then finally at Dur-Sharrukin or Khorsabad. The real founder of the great N. was Sargon II's son and successor, Sennacherib (705-681 BC). He planned the fortifications of this city, restored its temples, built its most magnificent palaces, and gave it a system of water works: he conducted water from the hills by 18 canals, and distributed it round the moats into the ponds and tanks within the city. It is computed that his great palace contained not less than 10,000 ft of walls lined with sculptured slabs. Ashurbanipal's reign (669-c. 633 BC) was the 'golden age' of Assyria and of N. His important work was the estab. of the great royal library at N. In the temple of Nabu at N. one library had already been in existence at least since Sargon II, but Ashurbanipal's library was to surpass all others in size and importance. He sent to all the old temples of Babylonia and had copies made of their mythological epics, hymns, and incantations. About 25,000 clay tablets were collected, containing chronicles, medical and other scientific literature, dictionaries, religious literature, official dispatches, and archives, business documents, and letters. They form the basis of our knowledge of the Assyrian and Babylonian language, literature, and hist. With the death of Ashurbanipal, the Assyrian period and that of N. had really closed. The kingdom and N. continued for 20 years more, but they were the years of a lingering death.

The story of N.'s fall is told by a Babylonian clay tablet preserved in the Brit. Museum: N. fell in 612 BC, the fourteenth year of the Babylonian king Nabopolassar (625-605 BC), who was joined in the destruction of this city by Cyaxares the Mede and the Scythians. The destruction of N. was predicted by the prophet Zephaniah (ii. 13-15), and in the book of Nahum (iii. 1-3) we have an ecstatic expression of delight at the prospect of ruin overtaking the hated city ('bloody throughout'). N. in its prime was, no doubt, a city of great magnificence. It was constructed of brick and enamelled tile, or of stone brought from nearby quarries. It was surrounded by brick walls 9 m. in length. Winged bulls and lions with human heads, and sculptured sphinxes with wings, guarded the gates of the royal palace, while its numerous rooms were decorated with bas-reliefs, mouldings, and carvings, giving evidence of no little artistic skill. Many reliefs and inscriptions are preserved in the Brit. Museum.

**Research.** Early in the 19th cent., Claude James Rich, resident of the E. India Co. at Bagdad, visited the mound Kuyunjik (and others), where he made slight excavations. In Dec. 1842 Paul

Émile Botta (of It. parentage), a Fr. vice-consul at Mosul, began digging on the site of N., but he worked there only for 3 months. He was followed by Victor Place. The excavations begun by a young Englishman of Huguenot descent, Austen Henry Layard, in 1845 at Nimrud (the biblical Calah) and Kuyunjik constitute the next great landmark in the hist. of modern archaeology. In 1847 Layard discovered at N. the palace of Sennacherib, which was largely unearthed from 1849 to 1851. In 1852 Hormuzd Rassam (who had been one of Layard's helpers) continued the excavation of N. under the direction of Sir Henry C. Rawlinson, the Brit. consul-general at Bagdad. Rassam, who worked until 1854, had the good fortune to find Ashurbanipal's palace and his great library. In Dec. 1872 George Smith, of the Brit. Museum, announced that among the tablets from N. he had found an account of the flood which closely resembled that in the Bible. This aroused so much interest that the *Daily Telegraph* commissioned Smith to undertake further explorations. George Smith worked at N. in 1873 and 1874. Between 1876 and 1933 there were 7 further expeditions to N. on behalf of the Brit. Museum. Finally, also on behalf of the Brit. Museum, in 1931-2 M. E. L. Mallowan (now prof. at the Institute of Archaeology, Univ. of London) excavated the first prehistoric settlement at N., underlying the Assyrian levels. See A. H. Layard, *Discoveries in the Ruins of Nineveh and Babylon*, 1853; S. Smith, *Early History of Assyria*, 1927; R. C. Thompson and R. W. Hutchinson, *A Century of Exploration at Nineveh*, 1929; *Nineveh and the Old Testament* (trans.), 1956; D. J. Wiseman, *Chronicles of Chaldean Kings*, 1956.

**Ninghsia**, formerly a prov. of Inner Mongolia, China, now merged with the prov. of Kansu.

**Ningpo** (or Yin hsien, city of the calm waves), a former treaty port and an important trading city of Chekiang prov., China, on N. Riv., 16 m. from its mouth opposite Chusan, and 95 m. from Hangchow. Manufs. include silks and other fabrics, gold, silver, and lacquered wares, carved wood, furniture, carpets, and confections. Tea, raw cotton, drugs, and straw goods are among the exports. Bamboos and rice are grown. There are salt works and fisheries near by. The ruined Pagoda (T'ien-feng-t'a) and the old Drum Tower are interesting buildings. N. contains numerous temples (e.g. that of 'the Queen of Heaven'), monasteries, schools, and clubs, and a fine library founded in the 16th cent. There was a Portuguese settlement from 1522 to 1545. A Brit. occupation took place in 1841-2, and in the latter year the port was opened to foreign trade by the treaty of Nanking. It serves as a distributing station for Shanghai. Pop. estimated (1949) 218,800.

**Ningyuan**, see KULJA.

**Ninian**, St (d. 432?), missionary preacher, probably from Strathclyde. He went to Rome and was ordained bishop of the S. Picts by Pope Siricius in 394. He founded the church of Candida Casa, or

Whithorn, in Wigtownshire, and dedicated it to St Martin of Tours. According to Bede, he preached Christianity to the Picts of all S. Scotland as far N. as the Grampians. His feast is on 16 Sept. See Bede, *Historia Ecclesiastica* and Ailred of Rievaulx, *Life of St Ninian*.

Ninon de l'Enclos, see L'ENCLOS.

Ninove, tn in the prov. of E. Flanders, Belgium, 14 m. W. of Brussels, on the R. Dender. There is a fortified city gate of the 18th cent. It has manufs. of safety matches, cotton goods, linen, lace, silk, gloves, and shoes. Pop. 11,700.

Ninus, see SEMIRAMIS.

Niobium (or Columbium, Cb), symbol Nb; atomic number 41; atomic weight 82.91. Discovered by Hatchett, 1801. A metallic chemical element, it is usually associated with tantalum, and occurs in the minerals tantalite, columbite, and fergusonite. The metal is obtained by reducing the chloride with hydrogen in a red-hot iron tube, or by reducing the oxide with carbon in the electric furnace. It is a steel-grey metal of sp. gr. 8.56, burns on heating in air, and is soluble in warm concentrated sulphuric acid. Its resistance to corrosion makes it suitable for the manuf. of chemical apparatus and it improves stainless steel. N. carbide is very hard and thus used for cutting-tools.

Niort, Fr. tn, cap. of the dept of Deux-Sèvres, on the Sèvre Niortaise. It has sev. fine churches and a massive keep. Mme de Maintenon and Fontanes (q.v.) were b. here. Footwear, gloves, and brushes are manuf. N. is known for its angelica. Pop. 32,800.

Nipigon, Lake, sixth largest of Ontario's immense number of lakes, has an area of 1750 sq. m. and 800 m. of shore line, and lies 35 m. N. of Lake Superior, in a forest reserve of over 7000 sq. m. It is 70 m. long and 50 m. wide, is exceedingly deep, and contains over 1000 is. The R. Nipigon drains the lake, and is the largest which flows into Lake Superior. The lake is notable for the grandeur of its scenery and its wild primitive surroundings.

Nipissing, Lake, lake of Ontario, Canada, about half way between Huron Lake and the Ottawa R. It is 50 m. long, 20 m. broad, and contains numerous is. The Sturgeon R. enters it on the N., and the outflow to Georgian Bay, Lake Huron, is by the French R.

Nippon, Nihon, Nippon, or Dai Nippon, native name for the whole of the Jap. Empire. It is used particularly of Honshu, the prin. is. of Japan.

Nippur, modern Niffer or Nuffar, ant. city of Sumer and Babylonia, c. 100 m. SE. of Bagdad. It was the seat of the god Enlil (q.v.), continuously occupied from Neolithic to Parthian times. The Amer. excavations (1889-1900; 1951-) are particularly notable for the many Sumerian literary texts discovered. See Seton Lloyd, *Foundations in the Dust*, 1956.

Niquiran. Some scholars still use this term (while others prefer the term *Nicarag*, an abbreviation from 'Nicaragua') for the important language, now extinct, which was spoken, at the time of

the Sp. conquest in the 16th cent., by the native pop. of the ter. lying between the Pacific Ocean and the Lake Nicaragua, and on the is. of that lake.

Unlike Mangue or Chorotega (which is an Ottomí-Mangue dialect), the prin. native language of Nicaragua still in existence, N., or Nahuatl, belongs to the Nahuatl linguistic family, being thus closely related to Aztec of Mexico, Pipil of Salvador, Guatemala, and Honduras, Tlascaltec of Salvador, and the extinct Sigua of Costa Rica and Cazan, which was spoken on the Rio Grande di Santiago. The Nahuatl group is a subdiv. of the Uto-Aztecan group of languages. The other two subdivs. are Piman or Sonoran, and Shoshonean. According to Sp. sources, the N. possessed codices written in pictographic script, but none has been preserved.

Nirvana, highest state of spiritual enlightenment attained by Buddha. It is the transitive moment when a Buddhist passes from his earthly life to the state of budhissattvaship. Existence is a continual passage from one state into the next, man's earthly life being but one episode. This 'round' of existence is but a veil over reality. If ignorance, desires, and all other 'poisons' can be removed, the individual is delivered from his fictitious individuality, and from the 'round.' This is the state of N., and is completely discontinuous from the 'round.' N. cannot be defined, since the terms used by man bear no relation to it. See BUDDHA AND BUDDHISM.

Niš (anc. Nalssus), tn in Serbia, Yugoslavia, on the Nisava. It was the bp. and the summer residence of Constantine the Great (see CONSTANTINUS I.). The tn was destroyed by the Huns in the 5th cent., and was rebuilt by Justinian the Great (see JUSTINIANUS, FLAVIUS ANICIUS). In 1914-15 it was the seat of the Serbian Gov. During the Second World War it was severely damaged, but has been reconstructed. An important road and rail junction. N. has railway workshops, chemical manufs., and a large trade in agric. produce. Pop. 60,700.

Nisan, see ABB.

Nishapur, dist. and tn of Khorasan, Persia, 44 m. E. of Mashhad. Omar Khayyám (q.v.) was b. and buried here. There is trade in almonds and fruits. Pop. of tn 25,800; of tn and dist. 181,700.

Nisi, Decree, see DIVORCE.

Nisi Prius (literally 'unless before'). When the judges sit at the assizes to try civil actions they are still said to be 'sitting at N. P.' though the words N. P. have lost their original significance. N. P. denotes no more at the present day than the commission by virtue of which judges are empowered to try civil causes at assizes. The words N. P. originated in the writ of *venire facias* (a writ addressed to the sheriff of a co. where a particular action was to be tried calling upon him to secure a jury) as altered in form by the Statute of Westminster II to square with a prevalent practice by which inconvenience to jurors was avoided. Prior to this alteration, if jurors were summoned

from any part of England whatsoever, they were bound at least in theory to come up to Westminster (where the king's courts then were) and wait about until the case in which they were summoned came on. The result was that the inconvenience was partially mitigated by the practice of attorneys allowing the action to be pending in Westminster from term to term until such time as the justices were about to go on circuit to the particular co. whence the jurors had been drawn, and then transferring the case to those justices as soon as it was certain they were coming. The Statute of Westminster II provided that the writ of *venire* should contain words to the effect that the sheriff should command the jurors to come to Westminster on such a day in such or such a term, *N. P.* (unless before) that day the justices appointed to take assizes should come into the co. in which the cause of action lay. See also ASSIZE.

**Nisibis**, ancient city, about 130 m. NW. of Mosul (N. Iraq). The cap. of an Assyrian dist. (Nisibina), caravan centre and fortress, it was of considerable importance in the wars between Rome and the Parthians. Nisibis was the Macedonian *Antiochia Myrdoniae* and finally fell to the Persians in AD 363. With the decline of the Aleppo-Mosul trade route, modern Nusaybin is but a small, mainly Armenian, town.

**Nismes**, see NÎMES.

**Nissa**, see CAITANISSETTA.

**Niterói**, cap. of Rio de Janeiro state, SE. Brazil, standing on the opposite shore of the harbour to Rio, with which it is connected by ferries. It is associated with the Indian chief, known as Martin Afonso, who assisted the early Portuguese colonisers. It has fine prov. gov. buildings and handsome private houses. Many Brit. and Amer. families live here. When the port installations are completed N. will become a port of call for transatlantic shipping. Pop. 174,500.

**Nith**, Scottish riv., rising about 8 m. S. of Cunnock, Ayrshire, which flows SE. for some 70 m. through Nithsdale to enter the Solway Firth 8 m. S. of Dumfries.

**Nithsdale**, William Maxwell, 5th Earl of (1676-1744), Scottish Jacobite. He joined the rising of 1715. He was captured after the battle of Preston, imprisoned in the Tower, and condemned to death. His wife devised a plot and secured his escape, disguised as a woman. He fled to Rome and joined the Elder Pretender. His lands were later restored to his son, though the title remained forfeit. The story of his flight was written by the Countess of N., and pub. in the *Transactions of the Society of Antiquaries of Scotland*.

**Niton**, see RADON.

**Nitra**: 1. Region (*kraj*) in Southern Czechoslovakia, bordering on Hungary, part of the former prov. of Slovakia (q.v.). It is generally low-lying, and is watered by the Dunaj (see DANUBE) and its tribs., the Váh (q.v.) and the N. Area 3077 sq. m. Pop. 690,000.

2. (Ger. *Neutra*) Czechoslovak town, cap. of the region of N., on the N. Riv. It is

the seat of a bishop, has a trade in agric. produce, and has some manufs. Pop. 18,000.

3. Riv. of Czechoslovakia, which rises in the Carpathians (q.v.) and flows S. through the region of N. to join the Dunaj at Komárno (q.v.). Length 120 m.

**Nitrates**, see NITROGEN.

**Nitre**, or **Saltpetre**, potassium nitrate ( $\text{KNO}_3$ ); Chile saltpetre is sodium nitrate ( $\text{NaNO}_3$ ). It is found on the ground and impregnating the upper soil in India and Persia; sodium nitrate is found in Chile and Peru. The soil is lixiviated and the pure salt obtained by crystallisation. Potassium nitrate is used in the manuf. of gunpowder, sulphuric acid, and nitric acid, and in medicine as a diuretic and diaphoretic. Sodium nitrate is used for the manuf. of potassium nitrate, and is an important fertiliser. N. when heated evolves oxygen and is converted into potassium nitrite.

**Nitrian Desert**, see NATION.

**Nitric Acid and Oxide**, see NITROGEN.

**Nitriding (Nitrogen Case Hardening)**, method of producing a very hard surface skin on steels by heating in ammonia at 500° C. for periods up to 96 hrs. A surface skin of nitride is formed on all steels by this treatment, but in most cases the skin is brittle. But with special 'nitralloy' steels, containing 1.4-1.7 per cent of chromium and 0.9-1.2 per cent of aluminium, the skin becomes intensely hard and firmly adherent. It resists wear and corrosion, and is used for surface hardening of gauges, spanners, gears, etc.; but it is not suitable for resisting severe localised pressure. The nitralloy steels possess mechanical properties comparable with those of a high tensile steel.

**Nitrification**, see NITROGEN CYCLE.

**Nitriles**, esters of hydrogen cyanide or prussic acid. They form a series which may be prepared by heating the alkyl halogen compounds with potassium cyanide. The lower members, as methyl cyanide, or acetonitrile ( $\text{CH}_3\text{CN}$ ), and ethyl cyanide, or propionitrile ( $\text{C}_2\text{H}_5\text{CN}$ ), are colourless liquids with a somewhat pleasant odour, and are miscible with water. The higher members are insoluble. The N. have corresponding isomers known as isonitriles, carbylamines, or isocyanides. They are poisonous colourless liquids of disagreeable odour. The aromatic N., e.g.  $\text{C}_6\text{H}_5\text{CN}$ , are also of importance. All N. on hydrolysis with caustic potash yield the potassium salt of the corresponding acid, e.g.  $\text{CH}_3\text{CN} + \text{KOH} + \text{H}_2\text{O} = \text{CH}_3\text{COOK} + \text{NH}_3$ .

**Nitrites**, see NITROGEN, *Compounds*.

**Nitrobenzene** ( $\text{C}_6\text{H}_5\text{NO}_2$ ), nitrated derivative of benzene. It is usually prepared by slowly adding to 10 parts of benzene a mixture of 12 parts of nitric acid of sp. gr. 1.45 and 16 parts of concentrated sulphuric acid at a temp. under 40° C. The vessel should be kept moving so as to keep the various constituents in contact, and when all the acid has been added, the mixture is heated to about 80° for half an hour, and then cooled. The N. collects at the top of the vessel, and after separation and washing with water, when it forms the

lower layer, it is dried over calcium chloride and distilled. N. is a pale yellow oil with a strong smell of bitter almonds. It has a sp. gr. of 1.2 at 20°, and boils at 205°; it is very slightly soluble in water. It is used for the manuf. of aniline and benzidine, and for flavouring and perfuming purposes under the name of 'oil of mirbane,' in spite of its poisonous nature. (1 : 3) metadinitrobenzene is a solid, obtained by using a higher temp. for the nitration. Other N.s are ortho-dinitro (1 : 2), para-dinitro (1 : 4), and trinitro (1 : 3 : 5), which is an explosive.

**Nitro-cellulose**, *see* CELLULOID; GUN-COTTON; PYROXYLIN.

**Nitro-compounds**, or **Nitro-derivatives**, those compounds which contain the

compound radicle  $\begin{array}{c} \text{O} \\ \diagup \text{N} \diagdown \\ \text{O} \end{array}$  (as opposed

to the grouping  $-\text{O}-\text{N}=\text{O}$  in the nitrites) directly attached to a carbon atom. When an aromatic compound such as benzene is treated with nitric acid of sp. gr. 1.3 to 1.5 at ordinary temps., a mononitro-compound is usually produced; and, generally speaking, the more concentrated the acid and the higher the temp. employed, the larger will be the number of  $\text{NO}_2$  groups introduced into the molecule. The product is in such cases a mixture of dinitro and trinitro derivatives. The concentration of the acid is usually effected by mixing the nitric with a larger proportion of concentrated sulphuric acid, which effectively absorbs the water produced in the reaction, and maintains the nitric acid in a concentrated condition. The N. are for the most part yellow, stable, crystalline substances, only slightly soluble in water, but readily soluble in alcohol, ether, etc. The higher N. such as picric acid and T.N.T. can be detonated and form widely used high explosives. With various reducing agents, as tin, with hydrochloric acid, N. are converted to amino-compounds, thus nitrobenzene ( $\text{C}_6\text{H}_5\text{NO}_2$ ) is converted into aminobenzene or aniline ( $\text{C}_6\text{H}_5\text{NH}_2$ ). The N. of the aliphatic bodies are obtained by the action of silver nitrite on an alkyl halide, and by the action of nitric acid on the hydrocarbon, both reagents being in the vapour phase.

**Nitrogen**, non-metallic chemical element, symbol N, atomic number 7, atomic weight 14.008 (Fr. *azote*, without life). At ordinary temps. it is a gas, and occurs in an uncombined state in the atmosphere, forming approximately 78.1 per cent of air by volume. It also occurs combined with other elements in animal and vegetable substances; in various minerals as ammonium salts; in the form of nitrates in Chile saltpetre and other deposits found in the soil. The gas is colourless, tasteless, and odourless; it is slightly soluble in water, to a less degree than oxygen; it is slightly lighter than air. Liquid N. boils at  $-194^\circ\text{C}$ . and solidifies to a white body at  $-214^\circ\text{C}$ . N. was discovered as a constituent of the atmosphere by Daniel Rutherford in 1772. It was recognised as an extremely inert gas, and

all attempts to bring about direct combination with other substances for a time failed. In 1785 Cavendish showed that N. combined with oxygen in the neighbourhood of an electric spark discharge. This method was used by later investigators, and in 1894 Lord Rayleigh demonstrated the presence of argon in the atmosphere by causing all the N. in a sample to be combined in this way. In 1892 Sir Wm Crookes showed that the electric arc caused the formation of a N. and oxygen compound. This has been put to commercial use.

The artificial production of N. compounds derives its importance from the part played by N. in vegetable life. N. does not constitute a large proportion of the elements contained in vegetable matter; but it is a very essential constituent, and, as far as is known, most plants are unable to utilise the N. of the atmosphere directly. The N. used in building up the tissues of plants is contained in the soil in the form of nitrates, ammonium compounds, etc. These nitrates may owe their existence, in part, to the activities of certain micro-organisms which have the power of causing the combination of atmospheric N. Under ordinary circumstances cultivated land uses up the nitrates thus formed more rapidly than they can be replaced, so that the N. supply has been a problem to the agric. world. Experiments have been successfully made in the direction of cultivating bacteria of peculiar effectiveness as regards production of nitrogenous compounds, but the usual method is to dress the soil with manures consisting largely of nitrogenous material. The main source of nitrogenous manure was for long the natural deposits found in vast quantity in parts of N. and S. America, particularly Chile and Peru. The continued exportation of these nitrates gave rise to the apprehension that they would quickly become exhausted, and Sir Wm Crookes predicted that this would happen in about 100 years. It therefore became of supreme importance that some technical method should be worked out for the solution of the problem. In war-time it is of obvious significance that a country must be capable of producing sufficient supplies of N. compounds such as nitric acid, if it is to be independent of outside help. Indeed it is often said that the Germans did not declare war in 1914 until they had perfected their method of making N. compounds from the air (*see* NITROGEN, FIXATION OF). Whatever the truth of the matter, Germany was in a position to be independent of outside supplies of nitrates when that war commenced.

N. is usually obtained from the atmosphere by removing the oxygen. This may be done by passing a current of air over copper heated to redness, by burning phosphorus in a confined volume of air, or by the action of an alkaline solution of pyrogallol on air. It may also be prepared by passing a current of chlorine through excess of ammonium hydroxide, or by heating ammonium nitrite or a mixture of ammonium chloride and



sodium nitrite. But perhaps one of the soundest methods is by the fractional distillation of liquid air. The gas obtained by removing the oxygen from atmospheric air contains argon and small quantities of other gases besides N. All of these gases are so inert chemically that they can only be separated with difficulty. Chemically N. is inert, on the whole, but it will combine with many metals on heating to form nitrides. In 1911 Strutt demonstrated that an electric discharge from Leyden jars acted upon a low pressure current of N. in such a way as to produce a continuance of the glow after the gas had passed the region of the discharge. The 'active N.' produced in the change is capable of bringing about various changes which ordinary N. cannot do. It combines with nitric oxide to form N. peroxide, with mercury to give a nitride, and it possibly consists of single atoms. All attempts to liquefy it have failed. This luminous gas also converts ordinary phosphorus into red phosphorus, while sodium and mercury combine with the gas when heated within it.

**Compounds.** N. forms with oxygen 5 oxides: nitrous oxide ( $N_2O$ ), nitric oxide (NO), N. trioxide ( $N_2O_3$ ), N. dioxide ( $NO_2$ ), and N. pentoxide ( $N_2O_5$ ). Nitrous oxide ( $N_2O$ ), or 'laughing gas,' is prepared by heating ammonium nitrate. The oxide is a colourless gas with a pleasant odour and taste. It condenses at  $15^\circ C$ . under a pressure of 50 atmospheres. It is soluble in water, is easily decomposed by heat, and resembles oxygen in supporting combustion, but it can be distinguished from the latter gas by mixing it with nitric oxide, when no brown N. dioxide is formed. It has marked anaesthetic properties, and is used in dental practice to a great extent. There is a corresponding oxyacid, Hyponitrous acid ( $H_2N_2O_2$ ), forming salts called hyponitrites, of which the silver salt is most usually prepared. Nitric oxide (NO) is prepared by the action of dilute nitric acid on copper, or by the action of sulphuric acid on a mixture of potassium nitrate and ferrous sulphate. It is a colourless gas which readily combines on admixture with oxygen, forming reddish-brown fumes of N. dioxide. It is only sparingly soluble in water. It can be converted into a liquid boiling at  $-153.6^\circ C$ . and into a solid which melts at  $-164^\circ C$ . The gas combines with ferrous sulphate to form an addition product which is easily decomposed by heat. This is the basis of a common test for a nitrate. Thus if a nitrate is dissolved in water and a crystal of ferrous sulphate is added and shaken up until dissolution takes place, then on tilting the tube and gradually pouring in strong sulphuric acid, a brown ring appears at the junction of the 2 liquids. N. trioxide ( $N_2O_3$ ) is prepared by decomposing a nitrite with sulphuric acid in the cold. It is a very unstable compound, and the gaseous form is probably a mixture of nitric oxide and N. tetroxide. At low temps. it condenses to a blue liquid. It is the anhydride of nitrous acid, which is also an unstable

body, readily decomposing into nitric acid and nitric oxide. Nitrous acid forms salts called nitrites, which are all soluble in water, and give off reddish fumes when heated with a warm mineral acid. N. dioxide, or tetroxide ( $N_2O_4$ ), is formed by the direct combination of nitric oxide with oxygen, and the condensation of the reddish-brown fumes. The liquid is colourless at low temps., but darkens in colour as the temp. rises. The behaviour of this body furnishes a good example of dissociation, a reversible thermal change,  $N_2O_4 \rightleftharpoons 2NO_2$ , mixtures of the two being known as N. peroxide. Bodies which burn with sufficiently high temps. to decompose the gas will continue to burn in it. Water dissolves N. peroxide with the production of nitrous and nitric acids at low temps., and of nitric acid and nitric oxide at high temps. N. pentoxide ( $N_2O_5$ ) is a white crystalline solid obtained by the action of phosphorus pentoxide on nitric acid at a low temp. At  $30^\circ C$ . the crystals melt to form a yellowish liquid which tends to decompose at higher temps. N. pentoxide is very readily soluble in water, forming nitric acid, which forms salts called nitrates. Nitric acid is a colourless, fuming liquid with a powerful oxidising action. It readily chars dry organic matter and attacks metals, forming the nitrates or the oxides. The nitrates are all soluble in water and decompose at high temps. N. forms with hydrogen the compound ammonia ( $NH_3$ ) (q.v.), which was at one time supposed to be the oxide of a metal ammonium. No such metal exists, however, and the ammonium salts are derived from a radicle ( $NH_4$ ), which behaves chemically in much the same way as the alkaline metals: sodium potassium, etc. Hydrazine  $N_2H_4$  is another compound, as is N. trichloride ( $NOCl_3$ ) obtained by the action of chlorine on ammonium chloride. It is a volatile yellow oil, irritating to the mucous membrane, and is very explosive. Nitrosyl chloride (NOCl) is obtained by the combination of nitric acid and chlorine. It is an orange-coloured gas which is readily liquefied. N. sulphide ( $N_2S_4$ ) is obtained by the action of ammonia on sulphur chloride. It is an orange-coloured crystalline solid, melting at  $178^\circ C$ . See also CYANAMIDE.

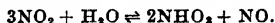
**Nitrogen. Fixation of.** Any process whereby elementary N. is converted into useful N.-containing compounds, particularly those connected with artificial manures, explosives, nitric acid, and ammonia.

(1) Under the action of an electrical discharge, N. and oxygen in air combine to a small extent.

$N_2 + O_2 \rightleftharpoons 2NO - 43,000 \text{ gm.-calories.}$   
Technical methods utilise this reaction.

In the Birkeland-Eyde process (formerly used in countries where electricity is cheap, e.g. Norway), an electric arc passing between water-cooled copper electrodes (alternating current at 5000 volts pressure) is spread out into a circular sheet of flame by the action of a strong magnetic field. Air is forced into the furnace containing

the electrodes and leaves at a temp. of about  $1000^{\circ}\text{C}$ ., after which it is cooled quickly, passes into chambers where the oxidation  $2\text{NO} + \text{O}_2 = 2\text{NO}_2$  (about 1-1.5 per cent of air converted) goes on, and thence to granite towers packed with quartz, down which water trickles.



The nitric acid produced is either kept as such, or converted into calcium nitrate. The remaining nitric oxide is largely absorbed in towers containing alkali, but some is lost. In the Pauling process



I.C.I.

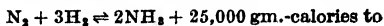
FIXATION OF NITROGEN: COMPRESSION PLANT OF THE BILLINGHAM AMMONIA SYNTHESIS PROCESS

The compressors shown are of the reciprocating type: those at the right raise the pressure of the gases used for ammonia production to 50 atmospheres, and those on the left complete the compression stage by further raising the gas to 250 atmospheres.

(Italy and Austria) the hollow, water-cooled electrodes are inclined at right angles, and the sheet of flame spreads up between them, whilst the Schönherr process utilises a long arc along which the air streams with a whirling motion. All these methods are now obsolete, having been replaced by (2).

(2) *Ammonia production.* In the Badische process steam and air are passed over hot coke, and the resulting gases subjected to a catalytic process, whereby carbon monoxide is converted into carbon dioxide. The mixture is compressed in stages to 200 atmospheres (the Claude process uses 1000 atmospheres), and

carbon dioxide removed by water, traces of carbon monoxide and poisons being removed later. The pure gas (a mixture of N. and hydrogen 1 : 3 by volume) is led into steel converters containing catalysts (e.g. iron) and promoters (e.g. molybdenum) at a temp. of nearly  $600^{\circ}\text{C}$ ., when the change goes on



about 8 per cent. The ammonia in the issuing gas is washed and removed, or converted into ammonium sulphate by the action of carbon dioxide and anhydrite suspension. Many details are kept secret. Sometimes electrolytic hydrogen is used.

(3) *Formation of nitrides, etc.* Serpek's process, now obsolete, utilised the action between alumina and coal heated in a current of N.  $1800\text{--}1900^{\circ}\text{C}$ .



with catalysts like copper. Rotating cylinders are employed for the mixing. With water the nitride forms ammonia. *Calcium cyanamide* ( $\text{CaCN}_2$ ). Calcium carbide (q.v.) made on the spot is finely pulverised, mixed with lime and heated in steel cylinders electrically to  $1000^{\circ}\text{C}$ ., when pure N., made by the distillation of liquid air is introduced. One ton of N. is fixed by the expenditure of 115 kilowatt-hours. The product is cooled, sprayed with a little water to remove carbide, and is known variously as lime N., calcium cyanamide, nitrolim, kalkstickstoff. It yields ammonia, especially when heated with water in an autoclave. Some plants (leguminous) can fix N. directly.

See J. Knox, *Fixation of Atmospheric Nitrogen*, 1921; J. R. Partington and P. H. Parker, *Nitrogen Industry*, 1922; F. Ernst, *Fixation of Atmospheric Nitrogen*, 1928; T. P. Hilditch, *Catalytic Processes in Industry*, 1929; and T. P. Hilditch and C. C. Hall, *Catalytic Processes in Applied Chemistry*, 1937; W. D. McElroy and B. Glass (eds.), *Symposium of Inorganic Nitrogen Metabolism*, 1956.

**Nitrogen Case Hardening, see NITRIDING.**

**Nitrogen Cycle, The.** Although the atmosphere contains 80 per cent of nitrogen it is unavailable as a food source. But all plants and animals need nitrogen to build up their proteins. The N. C. is a process by which plants obtain their nitrogen from nitrates in the soil, animals obtain their nitrogen from plant proteins, and complex dead residues are changed by micro-organisms to available forms of plant food. The whole cycle takes place in stages: *Protein breakdown* by which the proteins of dead plants and animals are broken down by putrefactive bacteria; *ammonification* where the products of protein breakdown are converted by fungi and bacteria to ammonia; and *nitrification* of the ammonia to nitrate which takes place in 2 stages. First, one type of bacteria oxidises the ammonia to nitrate and then the oxidation is completed by a second type. The nitrates are then utilised by plants. There is

some loss of nitrogen due to the activity of denitrifying bacteria which convert nitrogen compounds back to gaseous nitrogen. However, this loss is more than offset by *nitrogen fixation*, a process by which some bacteria can turn atmospheric nitrogen directly into protein. One species (*Rhizobium radicicola*) lives in small nodules on the roots of leguminous plants. Hence the value of clover crops, etc., in agriculture. See also CROPS.

**Nitrogen Peroxide**, see NITROGEN, Compounds.

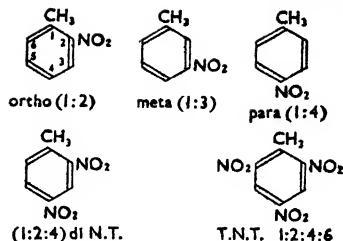
**Nitro-glycerine**,  $C_3H_5(ONO_2)_3$ , or more correctly glyceryl trinitrate, was produced first by Sobrero in 1846 by the action of nitric acid on glycerol. Nobel introduced it into the manuf. of explosives. It is prepared by adding one part glycerine to about 6 parts of a mixed acid of sulphuric and nitric acids containing little water, around or less than 0.5 percent; the mixture is kept cool by cooling coils or a water-cooled colandria. The N. separates from the nitrating acid and is separated off and washed sev. times with water and weak soda solution to free it from acid. It has a sweetish burning taste and is poisonous. N. is very sensitive to shock and friction, to avoid which special precautions are taken throughout manuf. Ignited or heated in a confined space it explodes violently. N. has found a wide range of uses as an ingredient in blasting explosives (ammonium nitrate mixtures), blasting gelatine, dynamite, propellants (cordites), and to a limited extent in medicine. See EXPLOSIVES.

**Nitrolime**, see KALKSTICKSTOFF.

**Nitro-sulphuric Acid**  $SO_3(OH)ONO_2$ , is possibly obtained as an intermediate product in the commercial manuf. of sulphuric acid. It is produced by the interaction of sulphur dioxide, nitrogen peroxide, and water. It is a white crystalline compound which is decomposed by excess of water, forming sulphuric acid and a mixture of nitric oxide and nitrogen peroxide.

**Nitrosyl Chloride**, see CHLORO-NITROUS GAS.

**Nitrotoluenes**. The nitration of toluene (q.v.) leads to the formation of a mixture of ortho (1:2) and para (1:4) Ns.,  $CH_3 \cdot C_6H_4 \cdot NO_2$ , which can be separated by fractional distillation. The ortho-compound is a liquid which solidifies at  $-10.5^\circ C.$  and boils at  $218^\circ C.$  whilst the para-compound is a solid melting at  $54^\circ C.$  and boiling at  $234^\circ C.$  They are both employed in the colour industry. Meta-N. is obtained from paratoluidine by converting it first into its acetyl derivative and then nitrating the latter. The resulting meta-nitro-para-aceto-toluide on hydrolysis and diazotisation in alcohol yields meta-N., a solid which melts at  $16^\circ C.$  and boils at  $230^\circ C.$  There are a number of dinitrotoluenes,  $CH_3 \cdot C_6H_3(NO_2)_2$ , the most important being the (1:2:4.) compound obtained by the further nitration of toluene. Trinitrotoluene, or T.N.T., is used as a powerful explosive (q.v.), and is obtained by the nitration of toluene. The formulae of the bodies mentioned are



**Nitrous Acid**, see NITROGEN.

**Nitrous Ether**, or **Ethyl Nitrite** ( $C_2H_5NO_2$ ), is a colourless liquid (sp. gr. 0.947 at  $15.5^\circ$ ; boiling-point  $17^\circ C.$ ) with a pleasant fruity odour like apples. It is usually prepared by distilling a mixture of alcohol and sulphuric acid with copper and nitric acid. It is insoluble in water, is hydrolysed by boiling water and dilute alkalis, and is a component of the 'sweet spirit of nitre' used in medicine.

**Nitrous Oxide**, see LAUGHING GAS and NITROGEN, Compounds.

**Nits**, see LICE.

**Nitti, Francesco Saverio** (1868–1953), It. politician and economist, b. Meli, Potenza. Formerly prof. of science of finance at Naples Univ., he was Liberal deputy from 1904 to 1922, and minister of commerce and agriculture in the Cabinet of Giovanni Giolitti, the Piedmontese bureaucrat, from 1911 to 1914. N. was minister of finance in Orlando's gov., 1917–19. Following the victories of Diaz in the First World War, N. became Prime Minister and minister of the interior, 1919–20. He attempted to deal firmly with the internal chaos in post-war Italy, and his domestic views were radical and progressive, but he lacked the drive to make his basic principles sufficiently felt, and in a sense his indecisive gov. paved the way for Mussolini, whom N. strongly opposed. N. lived in France throughout the dictatorship of Mussolini, being held prisoner by the Germans, 1943–5; but after the Second World War he returned as a leader of the National Democratic Union. Though his views were listened to with respect, he had by now ceased to exercise much political influence. In 1947 he tried and failed to form a gov., and subsequently retired from active political life. Pubs. by N. include *Europa senza pace*, 1921, *The Decadence of Europe*, 1922, and *L'Inquietude du monde*, 1934.

**Niuafuou**, or **Tin Can Island**, volcanic is. on the outskirts of the Tongan Group. After a violent eruption in 1946, the 1300 inhab. were removed and eventually resettled on Eua, S. of Tongatabu. Formerly it was of peculiar interest to tourists and philatelists because of its unique method of mail delivery which earned it the nickname of 'Tin Can Island,' inward mail being sealed up in tins and thrown from steamers into the sea, when it was picked up by 'postmen' who swam out to receive it.

**Niue**, coral is. in the S. Pacific Ocean, in lat. 19° 10' S. and long. 169° 47' W. It is 14 m. long and 10 m. wide. It was annexed, together with the Cook and other S. Pacific Is., to New Zealand in 1901. There is a resident commissioner, and laws, etc., are the same as for Cook Is. Straw-plaiting is one of the chief occupations, and hats, bananas, copra, baskets, and kumaras are exported. At Alofi, the seat of the administration and the port of the is., is a wireless station. Area 100 sq. m.; pop. 4763.

**Nivelle, Robert George** (1856-1924), Fr. general, studied at the École Polytechnique. He commanded the 11th Army, later becoming commander-in-chief of the armies of the N. and N.E. A former member of the Conseil Supérieur de la Guerre, in the First World War he first came to the fore at Verdun in 1916. In May 1916 he resisted the efforts of the Germans to overwhelm Fort Vaux, but ultimately both that fort and Douaumont (q.v.) fell. In Oct.-Nov., however, he launched a successful counter-attack on the E. bank of the Meuse, recovering both places, together with Dambloup, though it is commonly stated that the actual operations were conducted by Gen. Mangin (q.v.). Later in the same year Joffre was made a marshal of France, and N. was made commander-in-chief in his stead. During the general Ger. withdrawal in Mar. 1917 to the Hindenburg line (q.v.) N. conceived the bold plan of a 'decisive blow' and, abjuring the method of attrition, made preparations for a combined assault of all his armies from the Aisne heights from W., S., and SE., the most ambitious effort since the battle of the Marne of 1914. But he failed utterly, and a strong reaction set in against him, his methods being unfavourably contrasted with the more cautious Fabian strategy of Pétain and Foch (q.v.). The result was that the post of chief of the general staff in Paris was revived, and Pétain was appointed to fill it, the step being a mere formality to Pétain's eventual appointment to succeed N. as commander-in-chief of the Fr. armies, while Foch took Pétain's place at the Ministry of War. See F. E. A. Hellot, *Le Commandement des généraux Nivelle et Pétain*, 1917.

**Nivelles** (Flem. *Nijvel*), tn. in the prov. of Brabant, Belgium, 18 m. S. of Brussels. It has important railway works, and manufs. of paper and iron furniture. There are also steel works, copper foundries, and mills. The fine Romanesque church of St Gertrude, dating from the 11th cent., was heavily damaged in May 1940 when the centre of the city, with about 470 houses, was totally destroyed. Pop. 12,900.

**Niven, Frederick John** (1878-1944), Brit. novelist and poet, b. Valparaiso. Educ. at Hutcheson's Grammar School, Glasgow, and the Glasgow School of Art. He served in the Ministry of Information during the First World War. Later he settled in Brit. Columbia. Most of his works have Scottish or Canadian settings. His novels include *A Wilderness of Monkeys*, 1911, *Hands Up!*, 1915, *Sage-Brush*

*Stories*, 1917, *Justice of the Peace*, 1923, *Canada West*, 1930, *The Paisley Shawl*, 1931, *Mrs Barry*, 1933, *Triumph*, 1934, *The Flying Years*, 1935, *The Maillands*, 1939, *Mine Inheritance*, 1940, and *Prelude to Victory*, 1941. *Maple Leaf Songs*, 1917, and *A Lover of the Land*, 1925, are vols. of verse.

**Nivernais**, anct. prov. of central France, nearly corresponding to the present dept. of Nièvre. It was a duchy, its cap. was Nevers, and it once belonged to the Mazarins. Louis XIV joined it to the Crown in 1669. The canal of N., constructed 1781-1842, connects the Loire and and Yonne R.s.

**Nivkhi**, see GILYAKS.

**Nivôse** (snowy month), fourth month of the year in Fr. revolutionary calendar. See CALENDAR.

**Nix** and **Nixie**, in Teutonic mythology, male and female water sprites, for the most part malignant. They were represented as of human form, and frequently mixing with mortals, particularly in music and dancing. See also DEMONOLOGY. See K. Heckscher, *Die Volkskunde des germanischen Kulturkreises*, 1925.

**Nixon, Richard Milhous** (1913- ), Amer. politician, vice-president of the U.S.A., b. Yorba Linda, California. He graduated from Whittier College, 1934, Duke Univ. Law School, 1937, and practised law in Whittier, California, 1937-42. He served in the navy, 1942-6. N. was elected as a Republican to the House of Representatives in 1946, and to the Senate in 1950. He was, while in the House of Representatives, a member of the committee on Un-American Activities, played a prominent part in the case of Alger Hiss (q.v.), and was strongly in favour of continued investigation of Communist activity in the U.S.A. Nominated as Republican vice-presidential candidate in 1953, he was attacked for having accepted funds raised by Californian supporters for his political expenses. Elected, along with Eisenhower, he played a more extensive part in the gov. than is customary for the vice-president, partly owing to the illness of the President. He again ran for the vice-presidency in 1956, his candidature causing even more controversy, in view of Eisenhower's recent hist. of severe illness, and was re-elected with Eisenhower. See R. de Tolcmano, *Nixon*, 1957.

**Nizam**, title borne by the rulers of Hyderabad state (q.v.) in India till the reorganisation of states in 1956. The 7th and last N. was b. in 1886, succeeded to the title in 1911, became constitutional governor of his state under the constitution of 1950, and a private citizen in 1956.

**Nizami of Ganja** (1140/41-1202/3), Persian poet, b. Ganja. He enjoyed great popularity in Turkey as well as Persia. His main works are 5 *mathnavi* poems. The first, the *Treasury of Mysteries*, is mystical, and the other 4, *Khusrav and Shirin*, *Layla and Majnun*, the *Romance of Alexander the Great*, and the *Seven Effigies*, are romantic. N. is acknowledged by the Persians to be the greatest master of the romantic *mathnavi*. See W.

Bacher, *Nizmits Leben und Werke*, Leipzig, 1871.

Nizhny-Novgorod, see GOR'KIY.

Nizhny Tagil, city in the Sverdlovsk oblast of the Urals (Russia), 75 m. N. of Sverdlovsk. It is one of the chief metallurgical and engineering centres of the Urals, with 2 large iron and steel works (on local ore), a railway-car plant (biggest in Russia), and coking and chemical plants; it is also an important railway junction. N. T. is surrounded by a number of smaller iron and copper producing tns. It was founded in 1725 as an iron works; the first experimental railway in Russia was built here in 1834. It has seen particularly rapid industrial development since the 1930's. Pop. (1958) 297,000 (fifth in the Urals; c. 1914, 45,000; 1926, 39,000; 1939, 160,000).

Nizza, see NICE.

Njáls Saga, the longest and greatest of the Icelandic family sagas, relating events that took place in Iceland from 940 to 1015 approximately, the central event being the burning of Njál and his family in their house in 1010. Recent excavations seem to have located with certainty the site of the building. The standard Eng. trans. of the saga is Dasent's and is available in Everyman's Library (new ed., 1957).

N.K.G.B. (Russian abbreviation for People's Commissariat of State Security), the Soviet security service, 1943-6. It had essentially the same functions as its predecessor the N.K.V.D. (q.v.) and was largely occupied in dealing with 'unreliable' elements in tns. formerly occupied by the Germans, as well as with prisoners of war and civilian deportees returning from Germany. Many of these were sent to corrective labour camps (q.v.) or deported to Asiatic Russia. The latter treatment was meted out to certain native peoples of S. Russia as a whole (see BALKARS; CHECHEN-INGUSH; CRIMEA; KALMYKS; KARACHAY). Renamed M.G.B. (q.v.) in 1946.

N.K.V.D. (Russian abbreviation for People's Commissariat of Internal Affairs), name of the Soviet security service, 1934-1943. It had essentially the same functions as its predecessors the Cheka and the G.P.U. (q.v.), with the added responsibility for all places of detention (including corrective labour camps, q.v.), the ordinary police, and all civil registry offices. It was successively headed by Yagoda, Yezhov (1936-8), and Beria. The N.K.V.D. carried out the Great Purge (q.v.) and as a result became the most powerful apparatus in the state and the main pillar of Stalin's rule. After the Great Purge one of its main activities was the deportation of 'unreliable' elements from the border and the newly annexed tns. In 1943 it was divided into 2 commissariats, the N.K.V.D. and the N.K.G.B. (q.v.), the latter being responsible for state security. See M. Fainsod, *How Russia is Ruled*, 1953.

No, or No-Amon (Egyptian *nu-aa*, the large city, or *nu-Amen*, Amen's city), city in Egypt known to the Greeks as Thebes, and surviving to modern times in the ruins

at Karnak and Luxor. N. became prominent when from it sprang the 11th Dynasty; it was less prominent again till the time of the 18th Dynasty, then prominent to the 20th. It was the prin. centre of the worship of Amen, regarded as the equivalent of the Gk Zeus; hence its name No-Amon, of which the later Gk 'Diospolis' was a trans. The more ant Gk 'Thebes' was an adaptation of the Egyptian name *Ta-Opet*. See THEBES.

No Man's Land, name applied to outlying dists. in various countries. It has been used especially to designate the following: (1) region N. of Texas (Public Land Strip), ceded to U.S.A. in 1850, constituting Beaver co., Oklahoma, since 1890; (2) narrow dist. between Delaware and Pennsylvania; (3) small is. 3 m. SW. of Martha's Vineyard, Massachusetts, to which it belongs; (4) region corresponding to what is now Griguland E., Cape of Good Hope; (5) tract of S. Australia, 80,000 sq. m. in area; (6) battle zone between opposing front-line trenches in the First World War. It was also used as the name of a storage place on 18th-cent. ships.

Noah, son of Lamech, the biblical flood hero (Gen. vi-ix), builder of the ark in which he and his family survived the deluge, and as the patriarch of mankind; our benefactor also by the invention of wine and viticulture (Gen. ix. 20: 'And Noah the husbandman was the first to plant a vineyard').

Noah, the Book of, lost Heb. work which has, however, been largely incorporated into the Ethiopic Book of Enoch and the Book of Jubilees. It dealt with the birth and life of N. It must not be confused with the late Heb. work of the same name and partly based on it, given in Jellinek's *Bet ha-Midrash*.

Noah's Dove, see COLUMBA NOACHI.

Noailles, name of a noble Fr. family which dates from the 11th cent., the chief members of which are *Antoine de* (1504-1562), appointed admiral of France in 1547, and ambas. to England from 1553 to 1556. *François de* (1519-85), a diplomat, brother of Antoine, was ambas. to Venice and Constantinople. *Anne Jules* (1650-1708), 1st duke, took part in the siege of Maestricht in 1673, persecuted the Protestants in Languedoc, and became marshal of France in 1693. *Louis Antoine* (1651-1729) became Archbishop of Paris in 1695, and cardinal in 1700. *Adrien Maurice* (1678-1766), 3rd duke, was a distinguished soldier; he was defeated at Dettingen in 1743, but distinguished himself at Fontenoy in 1745. *Philippe* (1715-94), Duke of Mouchy, became marshal of France, and served in Germany and Flanders; he and his wife were guillotined. *Paul* (1802-85), 6th duke, politician and author, became a member of the Fr. Academy in 1849, and pub. *Histoire de la maison royale de Saint-Louis établie à Saint-Cyr*, 1843, and *Histoire de Madame Maintenon et des principaux événements de règne de Louis XIV*, 1848.

Noailles, Anna, Comtesse de (1876-1933), Fr. poetess, b. Paris, on her father's side a Rumanian, on her mother's side

descended from Gk aristocrats; by her marriage a member of Fr. aristocracy. Her poems are musical, personal, and often exotic and mystical. In 1901, after her marriage to Henri Mathieu, Comte de Noailles, in 1897, she pub. her first vol. of verses, many of which had been written when she was only 16. It was called *Le Cœur innombrable*, had an immediate success, and was crowned by the Fr. Academy. Other well-known books of poems are *L'Ombre des jours*, 1903, and *Les Vivants et les morts*, 1913. *L'Honneur de souffrir* was pub. in 1927, 4 years after the death of Maurice Barrès, one of her greatest friends. Her autobiography appeared in 1932. See lives by G. A. Masson, 1924; J. Larnac, 1931; M. Borély, 1939.

**Nobel, Alfred Bernhard** (1833-96), Swedish engineer and chemist, b. Stockholm. In 1842 he went to St Petersburg with his family, and studied the construction of torpedoes and marine mines with his father. In 1859 he returned to Sweden and devoted himself to the study of explosives, especially the utilisation of nitro-glycerine. In 1867 he discovered and patented the explosive mixture known as dynamite. A few years later he produced ballistite or smokeless powder. From his various other inventions and discoveries and the exploitation of the Baku oilfields, he amassed a large fortune. At his death he left the bulk of it in trust for 5 ann. prizes, to be awarded without distinction of nationality or sex, for eminence in physics, chem., physiology or medicine, literature, and to one who rendered the greatest service to promote international peace. See lives by H. Schlück and R. Sohlman, 1933, and Herta E. Pauli, 1948.

**Nobel Prizes**, prizes awarded, by the Swedish Academy of Science, for physics and chem.; by the Stockholm Faculty of Medicine, for medicine or physiology; by the Swedish Academy of Literature, for literature; and by a committee elected by the Norwegian Legislative Assembly, for peace. The prizes, which amount to about £8000 each, are awarded from the income of a capital sum of £1,750,000 left on trust by the Swedish scientist, Alfred Nobel (q.v.). This fund is administered by a board of directors chosen by the prize-awarding bodies above noticed, the president of the board being appointed by the Swedish Gov. Undistributed prize money reverts to the main fund or is reserved for each section. Mme Curie is the only case of an award of two prizes to one individual. The following lists show the winners of the various prizes from 1901 to 1957.

#### Physics

- 1901 W. K. Röntgen (German)  
1902 H. A. Lorentz and P. Zeeman (Dutch)  
1903 H. A. Becquerel (French) and P. and Marie Curie (French, b. Poland)  
1904 Lord Rayleigh (British)  
1905 P. Lenard (German)  
1906 J. J. Thomson (British)

- A. A. Michelson (American)  
G. Lippmann (French)  
G. Marconi (Italian) and F. Braun (German)  
J. D. van der Waals (Dutch)  
W. Wien (German)  
G. Dalen (Swedish)  
H. Kamerlingh-Onnes (Dutch)  
M. von Lane (German)  
W. H. Bragg and W. L. Bragg (British)  
No award  
C. G. Barkla (British)  
M. Planck (German)  
J. Stark (German)  
C. E. Guillaume (Swiss)  
A. Einstein (German)  
N. Bohr (Danish)  
R. A. Millikan (American)  
K. M. G. Siegbahn (Swedish)  
J. Franck and G. Hertz (German)  
J. B. Perrin (French)  
A. Compton (American) and O. T. H. Wilson (British)  
O. W. Richardson (British)  
Duc L. V. de Broglie (French)  
C. V. Raman (Indian)  
No award  
W. Heisenberg (German)  
P. A. M. Dirac (British) and E. Schrödinger (Austrian)  
No award  
J. Chadwick (British)  
C. D. Anderson (American) and V. F. Hess (Austrian)  
C. J. Davisson (American) and G. P. Thomson (British)  
E. Fermi (Italian)  
E. O. Lawrence (American)  
No awards  
O. Stern (American)  
I. I. Rabi (American)  
W. Pauli (Austrian)  
P. W. Bridgman (American)  
Sir E. Appleton (British)  
P. M. S. Blackett (British)  
H. Yukawa (Japanese)  
C. F. Powell (British)  
Sir John Cockcroft (British) and E. T. S. Walton (Irish)  
F. Bloch and E. M. Purcell (American)  
F. Zernike (Dutch)  
M. Born and W. Bothe (German)  
W. E. Lamb and P. Kusch (American)  
W. Shockley, J. Bardeen, and W. H. Brattain (American)  
Chen Ning Yang and Sung Dao Lee (Chinese)

#### Chemistry

- J. H. van't Hoff (Dutch)  
E. Fischer (German)  
S. A. Arrhenius (Swedish)  
Sir W. Ramsay (British)  
A. von Baeyer (German)  
H. Moissan (French)  
E. Buchner (German)  
E. Rutherford (British)  
W. Ostwald (German)  
O. Wallach (German)  
Marie Curie (French, b. Poland)  
V. Grignard and P. Sabatier (French)

## Nobel

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## Nobel

1913	A. Werner (Swiss)
1914	T. W. Richards (American)
1915	R. Willstätter (German)
1916-17	No awards
1918	K. Haber
1919	No award
1920	W. Nernst (German)
1921	F. Soddy (British)
1922	F. W. Aston (British)
1923	F. Pregl (Austrian)
1924	No award
1925	R. Zsigmondy (German, b. Austria)
1926	T. Svedberg (Swedish)
1927	H. Wieland (German)
1928	A. Windaus (German)
1929	A. Harden (British) and H. von Euler Chelpin (Swedish, b. Germany)
1930	H. Fischer (German)
1931	C. Bosch and F. Bergius (German)
1932	I. Langmuir (American)
1933	No award
1934	H. C. Urey (American)
1935	F. Joliot (French) and his wife Irene Joliot-Curie (French, b. Poland)
1936	P. J. W. Debye (German, b. Holland)
1937	W. N. Haworth (British) and P. Karrer (Swiss)
1938	R. Kuhn (German, declined award)
1939	A. Butenandt (German, declined award) and L. Ruzicka (Swiss)
1940-2	No awards
1943	G. Hevesy (Hungarian)
1944	O. Hahn (German)
1945	A. Virtanen (Finnish)
1946	J. B. Sumner, J. H. Northrop, and W. M. Stanley (American)
1947	Sir R. Robinson (British)
1948	A. Tiselius (Swedish)
1949	W. F. Gianque (American)
1950	O. Diels and K. Alder (German)
1951	E. M. McMillan and G. T. Seaborg (American)
1952	A. J. P. Martin and R. L. M. Synge (British)
1953	H. Staudinger (German)
1954	L. C. Pauling (American)
1955	V. du Vigneaud (American)
1956	Sir C. Hinshelwood (British) and N. Semenov (Russian)
1957	Sir A. Todd (British)

*Medicine and Physiology*

1901	E. A. von Behring (German)
1902	Sir R. Ross (British)
1903	N. R. Finsen (Danish)
1904	I. P. Pavlov (Russian)
1905	R. Koch (German)
1906	C. Golgi (Italian) and S. Ramón y Cajal (Spanish)
1907	C. L. A. Laveran (French)
1908	P. Ehrlich (German) and E. Metchnikoff (German-French, b. Russia)
1909	T. Kocher (Swiss)
1910	A. Kossel (German)
1911	A. Gullstrand (Swedish)
1912	J. Carrel (American, b. France)
1913	C. Richet (French)
1914	R. Bárány (Austrian)
1915-18	No awards

1919	J. Bordet (Belgian)
1920	A. Krogh (Danish)
1921	No award
1922	A. V. Hill (British) and O. Meyerhof (German)
1923	F. G. Banting and J. J. R. McLeod (Canadian)
1924	W. Einthoven (Dutch)
1925	No award
1926	J. Fibiger (Danish)
1927	J. von Wagner-Jauregg (Austrian)
1928	C. J. H. Nicolle (French)
1929	Sir F. G. Hopkins (British) and C. Eijkman (Dutch)
1930	K. Landsteiner (American, b. Austria)
1931	O. Warburg (German)
1932	Sir C. S. Sherrington and E. D. Adrian (British)
1933	T. H. Morgan (American)
1934	G. I. Minot, W. P. Murphy, and G. H. Whipple (American)
1935	H. Spemann (German)
1936	Sir H. H. Dale (British) and O. Loewi (Austria)
1937	A. von Szent-Györgyi (Hungarian)
1938	C. Heymans (Belgian)
1939	G. Donaghy (German)
1940-2	No awards
1943	H. Dam (Danish) and E. A. Doisy (American)
1944	J. Erlanger and H. S. Gasser (American)
1945	Sir A. Fleming and Sir H. W. Florey (British), and E. B. Chain (German)
1946	H. J. Muller (American)
1947	C. F. Cori and his wife Gerty Cori (American, b. Czechoslovakia), and B. Housay (Argentine)
1948	P. H. Müller (Swiss)
1949	W. R. Hess (Swiss) and A. E. Moniz (Portuguese)
1950	E. C. Kendall and P. S. Hench (American), and T. Reichstein (Swiss)
1951	M. Theiler (S. African)
1952	S. A. Waksman (American)
1953	H. A. Krebs (British) and F. A. Lipmann (American)
1954	J. F. Enders, T. H. Weller, and F. C. Robbins (American)
1955	A. H. T. Theorell (Swedish)
1956	W. Forssmann (German), A. F. Cournand (American, b. France), and D. W. Richards (American)
1957	D. Bovet (Italian, b. Switzerland)

*Literature*

1901	Rt. F. A. Sully-Prudhomme (French)
1902	T. Mommsen (German)
1903	B. Björnson (Norway)
1904	F. Mistral (French) and F. Eche-garay y Eizaguirre (Spanish)
1905	H. Sienkiewicz (Polish)
1906	G. Carducci (Italian)
1907	R. Kipling (British)
1908	R. Eucken (German)
1909	Selma Lagerlöf (Swedish)
1910	P. Heyse (German)

## Nobel

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## Nobility

1911	M. Maeterlinck (Belgian)
1912	G. Hauptmann (German)
1913	R. Tagore (Bengali)
1914	No award
1915	R. Rolland (French)
1916	Verner von Heidenstam (Swedish)
1917	K. Gjellerup and H. Pontoppidan (Danish)
1918	No award
1919	C. Spitteler (Swiss)
1920	K. Hamsun (Norwegian)
1921	A. France (French)
1922	J. Benavente (Spanish)
1923	W. B. Yeats (Irish)
1924	W. Reymont (Polish)
1925	G. B. Shaw (British)
1926	Grazia Deledda (Italian)
1927	H. Bergson (French)
1928	Sigrid Undset (Norwegian)
1929	T. Mann (German)
1930	S. Lewis (American)
1931	E. A. Karlfeldt (Swedish)
1932	J. Galsworthy (British)
1933	I. Bunin (French, b. Russia)
1934	L. Pirandello (Italian)
1935	No award
1936	E. O'Neill (American)
1937	It. M. du Gard (French)
1938	Pearl Buck (American, b. China of American parents)
1939	F. E. Sillanpää (Finnish)
1940-3	No awards
1944	J. V. Jensen (Danish)
1945	Lucila Godoy y Alcayaga (Gabriela Mistral) (Chilean)
1946	H. Hesse (Swiss, b. Germany)
1947	A. F. Gide (French)
1948	T. S. Eliot (British, b. America)
1949	No award
1950	Earl Russell (British)
1951	P. Lagerkvist (Swedish)
1952	F. Mauriac (French)
1953	Sir Winston Churchill (British)
1954	R. Henningway (American)
1955	H. K. Laxness (Iceland)
1956	J. R. Jiménez (Spanish)
1957	A. Camus (French)

## Peace

1901	H. Dunant (Swiss) and F. Passy (French)
1902	E. Ducommun and A. Gobat (Swiss)
1903	Sir W. R. Cremer (British)
1904	Institute of International Law
1905	Baroness von Suttner (Austrian)
1906	T. Roosevelt (American)
1907	E. T. Moneta (Italian) and L. Renault (French)
1908	K. P. Arnoldson (Swedish), F. Bajer (Danish), and A. M. F. Beernaert (Belgian)
1909	Baron d'Estournelles de Constant (French)
1910	International Peace Bureau
1911	T. M. C. Asser (Dutch) and A. H. Fried (Austrian)
1912	E. Root (American)
1913	H. La Fontaine (Belgian)
1914-16	No awards
1917	International Red Cross Committee
1918	No award
1919	W. Wilson (American)

1920	L. Bourgeois (French)
1921	K. H. Branting (Swedish) and C. L. Lange (Norwegian)
1922	F. Nansen (Norwegian)
1923-4	No awards
1925	C. G. Dawes (American) and Sir A. Chamberlain (British)
1926	A. Briand (French) and G. Stresemann (German)
1927	L. Quilide (German) and F. Buisson (French)
1928	No award
1929	F. B. Kellogg (American)
1930	Archbishop N. Söderblom (Swedish)
1931	N. M. Butler and Jane Addams (American)
1932	No award
1933	Sir N. Angell (British)
1934	A. Henderson (British)
1935	C. von Ossietzky (German)
1936	C. S. Lamas (Argentine)
1937	Viscount Cecil of Chelwood (British)
1938	Nansen Instructional Office for Refugees, Geneva
1939-43	No awards
1944	International Red Cross Committee
1945	C. Hull (American)
1946	J. R. Mott and Emily G. Balch (American)
1947	American Friends' Service Committee (Quakers) and Friends' Service Council, London
1948	No award
1949	Lord Boyd Orr (British)
1950	R. Bunche (American)
1951	L. Jouhaux (French)
1952	A. Schweitzer (French)
1953	G. C. Marshall (American)
1954	Office of the U.N. High Commissioner for Refugees (awarded in Nov. 1955)
1955	No award
1956	No award
1957	L. B. Pearson (Canadian)

**Nobelium**, heavy metallic element, atomic number 102. It was discovered in 1958 by Dr Albert Ghiorso of Gatlinburg, Tennessee, as a result of the bombardment of curium. *See also* ELEMENTS; TRANSURANIC ELEMENTS.

**Nobile, Umberto** (1885- ), It. aviator and aeronautical engineer, b. Avellino. He became director of the dept for aeronautical design and designed the dirigible *Norge* which made the successful Rome-Alaska trans-Polar flight in the Amundsen-Ellsworth-N. expedition of 1926. N. led the *Italia* airship expedition which flew to the North Pole but was wrecked off North East Land, and rescued by a Russian ice-breaker (1928).

**Nobile Officium**, in Scots law, the equitable jurisdiction of the Court of Session, somewhat akin to Eng. equity. In nearly all cases the power is exercised by the Inner House. The main purposes for which it may be employed are to supply omissions or remedy defects in statutes or deeds and to afford remedies by petition to the Inner House where no remedy is otherwise competent.

**Nobility**. It is difficult to define N.,



because the term connotes different qualities and privileges in different nations, and even in the same nation at different periods. N. does not necessarily imply titles, though at the present day it would be a violation of conventional ideas to speak of anyone as a noble who had no title, e.g. Article I of the U.S.A. Constitution contains a provision against the grant of any title of N. The Eng. baronial N. differed in important essentials from the N. of the Continent, whether of France, Germany, or the medieval rep. of Venice. Stubbs points out (*Constitutional History*) that 'the great peculiarity of the baronial estate in England, as compared with the Continent, is the absence of caste,' because in the Eng. system 'the theory of nobility of blood as conveying political privilege has no legal recognition.' This dictum, however, must be understood with the important reservation that Eng. peerages may become extinct or fall into abeyance, but so long as there is an heir to the title that heir is *ipso facto* an hereditary counsellor of the Crown or member of the House of Lords. The only difference, therefore, between the Eng. and the continental theory is that, whereas in the former one member only (the eldest son or next heir) of a family is noble in the sense of being a member of the peerage and an hereditary counsellor, in the latter the whole kin of certain families enjoyed political privileges from the fact of descent from an oligarchic aristocracy, and were therefore accounted noble.

*History.* Though political privilege is the mainspring of N., a brief survey of the 3 types of N., classic or ant., medieval, and modern, will reveal striking differences of origin and development. The types to be discussed are the patriciate of ant. Rome, the aristocracy of Greece, the N. of the Venetian rep., and the feudal aristocracy of England and their modern representatives.

The early Rom. patriciate, which was synonymous with the *populus* or original people of Rome, was based upon an eponymous ancestry (Romulus, founder of Rome) and upon the fact that the privileged members of the *gentes* were descendants of those who first occupied the hills of ant. Rome. Later, when it was shorn of its political privileges, the patriciate retained its spiritual or religious significance, because none but the members of a clan or *gens* could participate in the *sacra* proper to the *gens*, and because from very early in the hist. of Rome certain offices like those of the *flamens* (q.v.) always went to a patrician.

If any sort of generalisation be possible in the social distinction of a state so full of contradictions and seeming anomalies as ant. Athens, it is that the Athenian N. of the period prior to the Dorian invasion furnished a close parallel to the Rom. *populus*, being tribal in its genesis, and claiming precedence from an original occupancy of the soil; but that thereafter, in the heyday of the *demoi*, when the Eupatridae had lost all their political privileges, there was no N. in the true sense at all. But when the Dorians conquered the

Peloponnesus, there was an influx of wealthy families; and noble immigrant families like the Pisistratidae and Alomaeonidae outshone the old Athenian tribal N. in the eyes of the common people, and from that time the old military N. of Athens gave place to an aristocracy of wealth.

The hereditary N. of the rep. or signory of Venice traced its origin to no original occupancy, nor boasted a descent from a common founder of the race as distinct from past holders of office. The N. of Venice sprang conclusively from a commercial plutocracy and gradually usurped and retained all the political power in the rep. until the Church vindicated the rights of the lesser orders (see also MUNICIPALITY).

The Eng. N. of the Conquest and the Middle Ages was essentially feudal and military, and based upon the solid foundations of landed property. Like that of the feudal N. of the Normans and Germans, its origin is to be sought in the personal relationship of lord and vassal, and in the system of commendation by which the lord, in return for the allegiance and personal services (generally military or incidental thereto) of his vassal, gave or 'loaned' him land and guaranteed a reciprocal protection. The modern N. of England resembles the old feudal N. in no other respect than in the fact that it may possess landed estates; but for the rest the Brit. N. consists of a heterogeneous body of peers, some with patents entitling them to sit in the Upper House and some without, and baronets and knights, the great majority of whom possess titles of recent creation, awarded for political or other public services. Only a few of the existing Eng. peerages go back before the time of Wm Pitt the younger, who himself created over 100.

*Theory of nobility.* The theory of N. is biological, and based on the principle that selected stocks should be given opportunity and encouragement to develop and reproduce those qualities which are (a) most desirable in the higher administrative spheres; (b) difficult to acquire without leisure and economic independence; (c) lost again in a few generations of unfavourable environment.

In England emphasis is laid on lineal descent joined to wealth, and intensified environmental training in the public schools.

In Scotland and on the Continent less importance has been attached to the environment factor and more to matrimonial discrimination, or 'proof of nobility' (*preuves de noblesse*), i.e. '16 quarterings' (16 great-great-grandparents, or 8 great-grandparents) of the individual. The continental N. has always tried to maintain itself as a privileged caste, which has brought it into conflict with the bourgeoisie and proletariat. The Eng. system has been to maintain the peers and their immediate children as a high N. and to sink their junior descendants into a 'middle class.' The Scottish system also has been to sink the junior members of its N. into the mass of the people; but to

encourage even the poorest to retain their pride of race and sense of kinship to the chief or chieftain, whilst titles, etc., are regarded as reflecting credit, not merely on the holder, but on the whole clan.

**British nobility.** The term is used in 2 senses: (1) The 'gentle' classes, true equivalent of the continental *noblesse*, in which knights and baronets, and indeed younger children of peers, are included. In Britain, as on the Continent, the 'proof' of N. (*anglice* 'gentility') is lawful possession of armorial bearings, or paternal descent from an ancestor whom the Crown has either 'ennobled' by such a grant or recognised as already noble. In England Henry V definitely laid down that arms are 'tokens of nobility.' In Scotland non-nobles are prohibited by statute from bearing arms, but may be ennobled by grants of same; (2) N. in a restricted sense is applied to peers and their wives (sometimes children), who are equivalent to the *hoch adel* of the Continent. This peerage, or 'high nobility,' consists of the peerages of England and Scotland (created before 1707), of Ireland (created before 1800), and of Great Britain (1707-1800) and of the U.K. (since 1800). Each series consists of 5 degrees, (1) Duke, (2) Marquess, (3) Earl, (4) Viscount, (5) Baron, who differ in rank, but not as to privileges, except that peers of Scotland elect 16 (and until recently those of Ireland 28) representatives of their order, who, with all peers of England, Great Britain, and the U.K., form the 'Lords Temporal' of Parliament. The 2 archbishops and older bishops of the Church of England form the 'Lords Spiritual.' Unelected Scots and Irish peers, and peeresses in their own right, are members of the peerage, but not 'Lords of Parliament.' All peerages are hereditary (usually descending to the heir male of the body of the grantee) except the 'Law Life Peers' or Lords of Appeal in Ordinary, distinguished lawyers raised to the peerage for life to act as judges in the House of Lords.

A dukedom is the first grade of N., but archbishops, the moderator of the Church of Scotland, the Prime Minister, as such, and certain officers of state (including the lord chancellor) have precedence. 'Duke' is derived from *dux*, which among Saxons and Romans meant leader of an army. Being the highest dignity at the Crown's disposal, dukedoms have always been sparingly granted. Apparently the whole order became extinct in the reign of Elizabeth, but was revived by James I, who ennobled his favourite, George Villiers, as the Duke of Buckingham. Three of the present dukes are princes of the blood royal. Marquesses, too, exhibit a like conservatism in numbers. Now (and in Britain always) a mere title of honour, it originally denoted these great barons of the empire who held fiefs on the *marches* or borders. *Earls* are created comparatively often; the term 'earl' (or 'jarl,' a Dan. title which about the time of Ethelred, began to supersede that of 'ealdorman,' the chief magistrate of the shire in A.-S. times) denoted the head of a

shire. The expression 'belted earl' arises from the ancient mode of investiture of an earl, a belt with sword being buckled round the waist. The next degree, 'viscount,' is derived from *vicecomes*, i.e. the sheriff who presided in the co. court. Barons form the lowest grade of peers; anciently, they were those churchmen or laymen who held land of the king *per baroniam*, i.e. held by honourable service as feudatories of a prince (this still constitutes 'barony' and confers certain privileges in Scotland, without constituting a peerage). Baron or lord-baron is the most general title of N. in England. It was early decided that the fact of holding *per baroniam* did not necessarily give the right to be summoned by writ to the House of Lords. In Scotland the 'minor barons' were exempted from attendance in 1887, whilst the 'greater barons' remained as peers. Peers are created: (1) By writ of summons. Such peerages are not complete until the person honoured takes his seat in the House of Lords, when the title becomes hereditary. (2) By letters patent, which specify the line of descent of the dignity, and the heir specified in the patent succeeds even though the grantee die before taking his seat. Peeresses in their own right who marry commoners retain their titles, but peeresses by marriage lose their titles by remarriage. See G. E. Cokayne, *The Complete Peerage*, 1910 ff., vols. 1-13; also the latest editions of Burke's (see BURKE, SIR JOHN BERNARD) and Debrett's *Peerages*.

**Noble, Sir Andrew (1831-1915)**, Brit. armament-maker, b. Greenock, son of George N., naval officer. He was educ. at Edinburgh Academy and the Royal Military Academy, Woolwich. Assistant-Inspector of Artillery, 1859. In 1860 he assumed the direction of the ordnance dept. of Sir Wm. Armstrong's works at Elswick, becoming chairman of the company in 1900. He was awarded the Royal Society's gold medal in 1880.

**Noble, Sir Percy Lockhart Harnam (1880-1955)**, Brit. admiral. He was commander-in-chief W. approaches in Britain, 1941, and head of the Brit. Admiralty delegation to Washington, 1942-3.

**Noble**, anct Eng. gold coin, first minted by Edward III in 1344. Its original value was 6s. 8d., but, it having increased to 10s. (the Rose Noble) owing to the depreciation of silver, a new coin, called an angel (q.v.), of the former value of a N., was issued by Edward IV. On one side of the N. was stamped a ship to commemorate the victory of Sluys.

**Noble Gases**, see INERT GASES.

**Nocera Inferiore**, or **Nocera dei Pagani** (anct Nuceria), It. tn in Campania (q.v.), in the valley of the Sarno, 8 m. NW. of Salerno (q.v.). It has a cathedral, a ruined fortress, and a Rom. necropolis. There are textile manufs., and a trade in fruit and cheese. Pop. 37,100.

**Noctiluca**, genus of minute flagellate protozoa, found in all seas. They are phosphorescent, a bluish or greenish light being intermittently produced from

numerous minute points in the living matter, probably due to a rapid fermentation.

**Noctilucent Clouds** (luminous night clouds), very rare clouds which are only recognised after dusk because the sun is still shining at their exceptionally great height (about 80 km.). Usually observed about midnight in N. European lats. just after the summer solstice, they resemble cirrus and have a bluish-white to yellowish colour. A satisfactory explanation of their origin is lacking, but it is generally believed that they are composed of meteoric or volcanic dust. Other very high clouds seen after dark are known as *mother-of-pearl clouds*. Lower in average height (about 25 km.), they are roughly lenticular in shape with beautiful irisation, whence their name. Prof. H. Mohn first recorded observations of these clouds, mainly from Oslo, but most observations have been made by Prof. Carl Störmer, who pub. coloured photographs of them in *Weather* (vol. iii, Jan. 1948). Mr G. A. Clarke saw them from Aberdeen on 6 Feb. 1934; but in many years they have not been seen at all. Since 1926, by comparing photographs of the clouds as seen from different places against the stars the heights have been found to vary between 20 and 30 km.—well into the stratosphere. From the size of a large lunar corona seen in 1932, and from the position and colours of the irisation, the cloud droplets are estimated to be spherical with diameters from 1/1000 to 1/400 mm., the large drops being towards the centre of the cloud, and the probable temp. about  $-70^{\circ}\text{C}$ .

**Nocturn**, div. of matins in the Rom. and other breviaries. Each N. in the present Rom. breviary consists of 3 psalms and 3 lessons with their antiphons. See BREVIARY.

**Nocturne**, 'night piece' or instrumental serenade, generally of a quiet, lyrical character, but sometimes (as in Chopin) with a more agitated middle section. As a pianoforte piece it originated, not with Chopin, but with John Field (1782-1837), but it existed already as the *lt. notturno* in the 18th cent., when, however, it was similar to the Serenade or Divertimento in sev. movements. The N. in the modern sense is not necessarily slow, soft, and sentimental. Even Field's are not all so, and one is in the curious form of a vocal operatic scene; Debussy's *Fêtes* is a very animated piece; and in Vaughan Williams's *London Symphony* the scherzo is a N., i.e. a piece suggesting London's gaiety by night.

**Nodes**. The N. of a planet or any other celestial body are those 2 points where its orbit is cut by a fixed plane; in the case of the solar system, by the ecliptic. The straight line which joins these points is called the line of N. The point at which the orbit of a planet or any other body passes from south of the ecliptic to north of it is known as the ascending node, the other and opposite point necessarily being the descending node. The long. of the ascending node is one of the 6 'elements' by which the movements of a celestial body are determined. Owing to the mutual

attractions of the planets, the line of N. is continually shifting; alternately advancing and receding. The retrogression of planetary N. never exceeds 1 degree per cent., but owing to the great attraction of the sun the lunar N. complete a retrograde revolution in 6793.391 days, which implies a retrograde motion of  $19^{\circ} 21'$  in 365 days. The cycle, known as the *Saros*, (q.v.) was discovered by the Babylonian astronomers who observed that the eclipses of the sun and moon recurred in the same order in each cycle, which is 18 years 11 days.

**Nodier, Charles** (1780-1844), Fr. author, b. Besançon. In 1824 he became librarian at the Bibliothèque de l' Arsenal; in 1833 he was elected to the Academy; and in 1843 made a member of the Légion d' Honneur. He was the centre of the early members of the Romantic school; Hugo, de Musset, and Sainte-Beuve all acknowledged his influence. His best work consists of his fantastic short stories, among which are *Smarra*, 1821, *Trilby*, 1822, *Histoire du roi de Bohême et de ses sept châteaux*, 1830, *La Fée aux miettes*, 1832, *Inès de las Sierras*, 1838. See Prosper Mérimée, *Portraits historiques et littéraires*, 1874, and P. G. Castex, *Le Conte fantastique en France de Nodier à Maupassant*, 1951.

**Nodules**, see ROOT TUBERCLES.

**Noel, Conrad le Despenser** (1869-1942), Eng. clergyman and Socialist, son of Roden N., poet, educ. at Corpus Christi College, Cambridge, and at the Chichester Theological College. He worked for some years among the poor of Portsmouth. As vicar of Thaxted from 1910 to 1942 N. was nicknamed the 'red priest' on account of his Socialist views and the red flag he flew from his church; he was a prominent member of the Christian Socialist movement. He lectured to Socialist groups and wrote a number of religious and political works, including *The Labour Party*, 1906, *Socialism and Church History*, 1910, *Byways of Belief*, 1912, *Uplifting the Son of Man*, 1919, *Life of Jesus*, 1937, and *Jesus the Heretic*, 1939. His unfinished autobiography was pub. in 1946.

**Noetus** (c. AD 130-c. 200), priest of Asia Minor, b. Smyrna, became a leader of the Patristians (q.v.), and was excommunicated. His contemporary Hippolytus's *Sermon against the heresy of a certain Noetus* is the authority for his doctrines, which his disciple Epigenus (followed by Cleomenes and Sabellius) preached at Rome.

**Nœux-les-Mines**, Fr. tn in the dept of Pas-de-Calais, S. of Béthune, in a coal-mining dist. Pop. 12,600.

**Nogales**, twin city of Sonora, NW. Mexico, situated on the frontier line, one half in Mexico and the other in Arizona. It stands at an altitude of 4000 ft above sea level, and it is here that the S. Pacific Railroad of America connects with the S. Pacific Railroad of Mexico. The new Pacific Coast Highway is opening up important tourism and trade prospects. The main industries in the dist. are mining and cattle ranching. Winter

vegetables are exported to the U.S.A. Pop. 14,000.

**Nogay**, Turkic-speaking people of N. Caucasus, who live in the Groznyy oblast and Circassian Autonomous Oblast, with a pop. of 36,000 in 1926. They are Sunni Muslims, and mostly peasants, engaged especially in sheep-rearing, but are now collectivised. They formed part of the Golden Horde (q.v.); in the 14th cent. they formed a separate N. Horde which later broke up. They voluntarily submitted to Russia between the 16th and 18th cents.

**Nogent-le-Rotrou**, Fr. tn, cap. of an arron., in the dept of Eure-et-Loir. It has a ruined 11th-15th-cent. château. Pop. 7800.

**Nogent-sur-Marne**, Fr. tn in the dept of Seine, an E. suburb of Paris. It has a 12th-13th-cent. church, and a fort. Watteau (q.v.) *d.* here. There are chemical and pottery manufs. Pop. 21,000.

**Nogi**, **Marasuke**, Count (1849-1912), Jap. soldier, *b.* Yamaguchi of a Samurai family, saw his first military service in the civil war of 1877, in which the Samurai were finally defeated (*see* JAPAN, *History*). He commanded a brigade in the war against China in 1894, and in the Russo-Jap. war (1904-5) he commanded the Third Army. It was N. who forced Port Arthur to surrender and it was his army's flank march which resulted in the signal and decisive Jap. victory in the battle of Mukden (20 Feb.-10 Mar. 1905). Together with his wife he committed 'honourable suicide' (*hara-kiri*, q.v.), according to the old-estab. custom, on the death of the mikado, Mutsuhito.

**Noginsk** (formerly **Bogorodsk**), tn in the Moscow oblast of central Russia, 35 m. E. of Moscow. Varied textile industries (cotton, wool, and silk) have been carried on since the 19th cent. Known since the 16th cent. as a vil., it became a tn in 1781. Pop. (1939) 81,000 (38,000 in 1926).

**Nograd County**, *see* SALGÓTARIAN.

**Noguchi, Hideyo** (1876-1928), Jap. bacteriologist and pathologist, *b.* Inawashiro. He studied at Tokyo, graduated in 1897, and worked at the Institute for Infectious Diseases there, 1898-1900, when he entered the laboratory of pathology at Pennsylvania Univ. He made researches into immunity against snake poisons and in 1904 pub. *The Action of Snake Venom upon Cold-blooded Animals*. At the Rockefeller Institute, which he joined in 1904, he did valuable work on the aetiology of syphilis and the cultivation of spirochaetes; he also studied the aetiology of trachoma and yellow fever, of which latter disease he *d.* when conducting investigations in Brit. W. Africa.

*See* life by G. Eckstein, 1931.

**Nogués, Auguste** (1876- ), Fr. soldier, *b.* in the Hautes-Pyrénées, was educ. at the Ecole Polytechnique and was an artillery captain in the First World War. After the war he served against the Rifa (*see* ABD-EL-KRIM), 1924-6. Appointed resident-general of Morocco in 1936, and

commander-in-chief in N. Africa in 1939, he retained these posts during the Vichy regime. In 1940 he informed the Axis countries and Franco that he would not surrender N. Africa to any invader, even if he were ordered by Pétain to do so. After the landing of the Anglo-Amer. armies in N. Africa and the assassination of Darlan (q.v.) he became a member of Giraud's (q.v.) Fr. Imperial Council and deputy high commissioner for N. Africa, 1942-3. Early in 1943 he declared that he could not understand his unpopularity with the Americans, averring that he was justified in opposing the allied invasion. On 4 June 1943 Nogués, condemned by Gen. de Gaulle as a collaborator with Vichy, submitted his resignation.

**Noh-play**, traditional opera of Japan. It was estab. in the early 15th cent. by Kan-ami Kiyotsugu, and perfected by his son, Zeami Motokiyo. N. is performed on a square. The number of characters is generally less than 10 but sometimes as many as 20. They are accompanied by a chorus, seated to the right of the stage. The orchestra, seated to the rear, consists normally of 4 instruments: Jap. flute, *kotsuzumi* (small drum), *okawa* (medium drum), and *taiko* (large drum struck with 2 sticks). The outstanding characteristic of N. is its extreme simplicity; action and scenery are reduced to a minimum. Dances, on the other hand, are elaborate, and costumes magnificent. N. remains popular, and is taught by no fewer than 5 special schools to more than 2 million trainees. *See* also DRAMA, *Japanese Drama*.

**Noisy-le-Sec**, Fr. tn in the dept of Seine, a NE. suburb of Paris. It has chemical manufs. Pop. 16,100.

**Nokrashy Pasha**, **Mahmud Fahmy El** (1888-1948), Egyptian statesman, *b.* Alexandria, educ. at the Higher Training College, Cairo, and at Nottingham Univ. College, and entered the teaching profession. Later he entered the Ministry of Education in an administrative capacity. He was an active member of the Wafdist party; in 1930 he entered the first Wafdist gov. as minister of communications, a post which he held again from 1936 to 1937. In 1937, following the Montreux conference which ended capitulations, he was unexpectedly excluded from the Wafdist gov. through disagreement with the Wafdist leader over the Blue Shirt organisation. Soon after this N., with Ahmed Maher Pasha and their respective followers, resigned from the Wafd to form the Saadist party, pledged to uphold the true principles of Saad Zaghlul Pasha. From 1938, when the Saadists joined the coalition gov., N. held successive portfolios. In 1945 he succeeded to the premiership and leadership of the Saadist party, following the assassination of Ahmed Maher. Apart from a short period in 1946, when Sidky Pasha (q.v.) was premier, N. was head of the gov. until his assassination on 28 Dec. 1948. N. was responsible for breaking off the treaty negotiations with Britain and headed the Egyptian delegation to the Security Council of the U.N., 1947. He

enjoyed the reputation of being a first-class administrator, and was respected by all parties for his integrity.

**Nola**, It. tn in Campania (q.v.), 14 m. ENE. of Naples (q.v.). It has a 14th-15th-cent. cathedral, the remains of a 4th-cent. church, and a palace. Augustus (q.v.) d. here, and Giordano Bruno (q.v.) was b. here. Pop. 21,900.

**Nöldeke, Theodor** (1836-1930), Ger. orientalist, b. Harburg. His first work was a hist. of the Koran (1859), which won the prize of the Fr. Académie des Inscriptions, and which he rewrote in German as *Geschichte des Korans*, 1860 (ed. F. Schwally, 3 vols., 1909-38). In 1861 he lectured at Göttingen; in 1868 was prof. at Kiel, and from 1872 to 1906 prof. of oriental languages at Strasburg. N. was the author of many works on E. languages, literature, and hist., including *Sketches from Eastern History* (Eng. trans., 1892) and a *Syriac Grammar* (Eng. trans., 1904). See E. Kuhn *Übersicht der Schriften Theodor Nöldekes*, 1907, and *Festgabe für Theodor Nöldeke* 1916.

**Nolle Prosequi**, in legal practice an entry in the record of a court which indicates that the crown, in a criminal prosecution desires to proceed no further with the case. Formerly the practice in entering a N. P. applied both to civil and criminal suits, but it is now restricted to the stay of proceedings by indictment or information which can be entered only on the fiat (q.v.) of the attorney-general or solicitor-general.

In criminal cases when an indictment (q.v.) has been found (see JURY), proceedings on it can be stopped only by the Crown entering a N. P. against one or all of the defendants.

**Nollekens, Joseph** (1737-1823), sculptor, b. Soho. In 1760 he went to study in Rome, where Garrick met him and commissioned him to execute a bust. This was so successful that Sterne sat to him. He increased his income by buying and selling antiques, and by stock exchange speculation, and was so successful that at his death he was worth £200,000. He returned to England in 1770, and was soon the fashionable sculptor of the day, eccentric in character but very able in portraiture. See G. W. Stonier (ed.), *Nollekens and his Times* (by J. T. Smith, 1828), 1948, and P. Colson, *Private Portraits*, 1949.

**No-load Characteristic**, curve showing the terminal voltage as function of exciting current of a separately or shunt-excited d.c. generator at constant speed. See ELECTRIC MACHINES.

**Non-de-plume**, see PSEUDONYM.

**Nomad** (Gk *nomas*, roaming, particularly in search of pasture, from *nemein*, to pasture), member of a race, tribe, or community who have no fixed abode, but whose chief occupation is the tending of flocks and herds and who wander about, shifting their location according to the state of pasturage, and living in tents on grassland or steppe. The Bedouins or desert-dwellers offer the most characteristic example of N.s, and they even claim to be descended from Ishmael. The

Bedouins are found mostly in Arabia or other Middle E. countries such as Iraq and Egypt, have a tribal organisation under sheikhs, tend herds of camels or goats and flocks of sheep, and are good horsemen (see BEDOUINS). Other examples are the Australian blackfellows and S. African bushmen (q.v.) who derive their subsistence from hunting. Gypsy van-dwellers may also be said to lead a nomadic life (see GYPSY). Among the Hamitic tribes of E. Africa the Galla (q.v.) and Borana, the Masai (q.v.) and Turkana, all cattle-owning people, are still nomadic; but the Nandi (q.v.) and Suk of Kenya, with the Teso (q.v.) of N. Uganda, live in vils, and practise agriculture. See Sir II. H. Johnston, *The Uganda Protectorate*, 1902; W. Elardt, *Die Kulturform des Nomadismus*, 1923; P. G. Merner, *Das Nomadenium in Nordwestafrika*, 1937.

**Nome**, term used for a territorial div. of auct Egypt, and for a prov. of modern Greece.

**Nome**, tn S. of the Seward Peninsula, NW. Alaska, on N. shore of Norton Sound, 13 m. W. of Cape Nome. It is the centre of a great gold-mining dist., discovered in 1899, and the commercial and supply centre for NW. Alaska. It has a federal building, schools, and a hospital. Nome is a seaport (open May-Nov.) with connection to Seattle, and an air base and commercial airport. Fur farming, trapping, and fishing are important activities. Pop. 1852.

**Nomenclature**, see NAMES.

**Nominalism**, as opposed to *Realism* (q.v.), was one of the two doctrines of the Middle Ages, which arose from a consideration of the nature of species and genera. N. implies a belief in the theory that 'universals,' i.e. genera and species, are mere names. The Nominalists, as opposed to the Realists, who, with Plato, declare that class terms are real, more real than the individual things which come under them, deny that the concept, or class, has an existence of its own beyond the individuals which make up the class. A narrower form of N. hold that even concepts or ideas are not really general.

Roscelin in the 11th cent. was a celebrated nominalist, but his teaching was condemned by the Church as involving a tritheistic doctrine of the Trinity. Abelard (q.v.) was a conceptualist (see CONCEPT AND CONCEPTUALISM), but he tended towards N. and was also condemned by the Church. Later, in the 14th cent., Wm. of Occam upheld N., and among more modern philosophers Hobbes and Berkeley may be mentioned as holding modified forms of the doctrine. See also REALISM and SCHOLASTICISM. See A. Rogers, *History of Philosophy*, 1921.

**Nomuka**, one of the is. of the Haapai Group of Tonga.

**Non-commissioned Officers**, see RANK.

**Nonconformity**, or Dissent, refusal to conform to an estab. order (usually religious). In the 17th cent. N. signified remaining within the bounds of the Anglican Church, yet refusing to conform to certain ceremonial practices, such as the use of the surplice, of the sign of the cross

in baptism, and of the ring in marriage. Eng. N. in the present meaning of the term dates from immediately after the Reformation. The violence of the Puritans turned the state against them, and during the reign of Elizabeth I they were persecuted. Under James I, brought up amongst Presbyterians in Scotland, they expected more favourable treatment, but the Hampton Court Conference speedily disabused them. Owing to the identification of king and bishop, the supremacy of Parliament was marked by a vigorous attack on Episcopacy, at first in the interests of Presbyterianism, but later in those of Independency. But the reaction against the Commonwealth which followed was directed also against Puritanism. The Restoration of 1660 was followed by legislation against Nonconformists. The Act of Uniformity, 1662, drove from eccles. benefices a large number of Puritan ministers, intruded under the Commonwealth, who would not receive episcopal ordination. The Conventicle Act, 1664, penalised all attending dissenting conventicles, and the Five Mile Act, 1665, forbade Puritan ministers to travel within 5 m. of a corporate tn. The Test Act, 1673, directed principally against Rom. Catholics, also pressed hard upon Protestant dissenters, and no satisfaction was felt by them at James II's Declaration of Indulgence, 1687-8, obviously intended to relieve Rom. Catholics. With the accession of William and Mary, and the Toleration Act of 1689, most of the disabilities imposed by the Clarendon Code went, though the Corporation Act and the Test Act remained in force until 1828.

In 1730 a non-corporate union of Baptists, Independents, and Presbyterians was formed. Outside this union the chief dissenting bodies were at this time the Quakers and the Unitarians. But by 1760 another important body joined them with the secession of the Methodists from the estab. church. The Corporation and Test Acts were repealed in 1828; in 1836 marriage in a dissenting chapel was made legal; in 1871 the univs. were opened to non-members of the Church of England; in 1880 Nonconformist ministers were allowed to conduct funerals in the par. burying grounds. In 1892 the National Council of the Evangelical Free Churches was set up (this became the Free Church Federal Council (q.v.) in 1940). In 1932 the United Methodists combined with the Wesleyan Methodists and Primitive Methodists to form the Methodist Church.

N. as a name for non-Anglican Protestants can only apply in England itself, where the Anglican Church is estab. The term is better replaced by one of wider reference, the Free Churches, free as dissenting from the historic creeds, episcopate, and systems of the Roman, E. Orthodox, or Anglican Churches. *See* BAPTISTS; CONGREGATIONALISM; FRIENDS, SOCIETY OF; METHODISM; PLYMOUTH BRETHREN; SALVATION ARMY; ADVENTISTS; UNITARIANISM. *See also* D. Coomer, *English Dissent, 1714-60*, 1946, and H. Davies, *English Free Churches*, 1952.

**Non-contributory Pensions**, *see* NATIONAL INSURANCE ACT (1946).

**Non-co-operation**, *see* PASSIVE RESISTANCE.

**Nones**, *see* BREVIARY.

**Nones**, in the Rom. calendar the ninth day before the Ides, i.e. the 5th of all months except Mar., May, July, and Oct.

'March, July, October, May  
Make Nones the 7th, Ides the 15th, day.'

*See* CALENDAR.

**Nonesuch Press**, *see* MEYNELL, SIR FRANCIS.

**Non-Intervention Committee**, committee of various European states set up at the beginning of 1937 to supervise measures agreed on between them to stop the flow of volunteers to both sides in the Sp. Civil War, 1936-9. It formulated a plan for watching the Sp. coasts and frontiers which by the autumn had proved unworkable, gaps and loopholes in it having permitted enormous quantities of war material and even whole armies to come to Spain, while Germany sent bombers to attack the tns of the republicans. In the last stage of the conflict the committee censured its activities, the policy of non-intervention having in fact much favoured the insurgents, for the republicans had derived little effective countervailing help even from the Soviet Union. *See further under* SPAIN, *History*.

**Nonius, Fernan**, *see* NUNEZ.

**Nonius Marcellus**, Lat. grammarian, probably of the 4th cent. AD. He is noted as the author of *De compendiosa doctrina*, valuable for the fragments preserved from old dramatists, satirists, and annalists such as Ennius, Cato, and Varro. Priscian and Fulgentius borrowed from this work. *See the ed. of* W. M. Lindsay (3 vols.), 1903.

**Non-jurors**, those clergy of the Church of England who after the revolution of 1688 refused to take the oath of allegiance to William and Mary. They were headed by Wm Sancroft, Archbishop of Canterbury, and included 7 other bishops: Ken of Bath and Wells, White of Peterborough, Lake of Chichester, Turner of Ely, Frampton of Gloucester, Thomas of Worcester, and Lloyd of Norwich. About 400 of the lower clergy refused to take the oath, among them being many distinguished ecclesiastics. Some soon returned to the Estab. Church, but the body continued to exist with gradually diminishing numbers well on into the 19th cent. *See* T. Lathbury, *History of the Non-Jurors*, 1845, and J. H. Overton, *The Non-Jurors*, 1902.

**Non-metals**, one of the 2 classes into which chemical elements are divided. Their characteristic physical properties are as follows: they may be gases, liquids, or solids at ordinary temps., and most of the liquid and solid N. are easily converted into the gaseous state at comparatively low temps. They are brittle, if solid, generally have a low sp. gr., and are bad conductors of heat and electricity. The chemical properties give a more definite test. The N. form acidic oxides, they are not acted upon by dilute mineral

acids, and generally form stable compounds with hydrogen. The distinction between N. and metals is, however, by no means always well defined, and several elements, such as arsenic and antimony, possess characteristics of both classes. Examples of N.: hydrogen, oxygen, nitrogen, chlorine, helium, carbon, sulphur, boron, phosphorus, silicon.

**Non Nobis Domine**, canon possibly but by no means certainly by Wm Byrd (q.v.) which is often sung in England in place of grace at dinners.

**Nonnus**, Gk epic poet of the mid 5th cent. AD, a native of Panopolis, Egypt. His most noted work is the *Dionysiaca* (Hist. of Bacchus). A *Paraphrase of St John's Gospel* is also extant (written in Gk hexameters). N. was probably a Christian. His *Dionysiaca* was ed. by A. Ludwich (2 vols.), 1910-11, and trans. by W. H. D. Rouse (3 vols.), 1940. There is an ed. of the *Paraphrase* by A. Scheindler, 1881. See P. Collart, *Nonnos de Panopolis*, Cairo, 1930.

**Nonpareil**, printing type (6 point) in which the text of this encyclopaedia is set. The French name signifying 'none similar' refers to the exceptional skill displayed in the final cutting of so small a character. See TYPE and TYPEFOUNDING.

**Non Possumus** (Lat., 'we cannot'), papal formula used to express refusal, final and absolute, taken from the words of St Peter and St John (Acts iv. 19-20). It is said to have been used by Clement VII in reply to Henry VIII's demand for a divorce from Catherine of Aragon.

**Non-Suit**. Technically a N.-S. no longer exists. Under the former practice N.-S. meant the voluntary abandonment by the plaintiff of his action, either because the judge or jury appeared to be against him or because in argument it appeared that in law he had no case. It differed from an adverse judgment in that it did not bar him from commencing the action again. In the days when forms of action, e.g. detinue (q.v.), trespass (q.v.), were so highly technical that the slightest verbal slip in the pleadings endangered the whole action, N.-S.s were frequent, but since the legal reforms of the last cent. such unsubstantial formalities, and together with them N.-S.s, have been abolished. The modern equivalent is a ruling by the Court either of its own volition or on the submission of counsel that the defendant has no case to answer. There is no formality to be observed, and the submission that there is no case can be argued at any stage of the proceedings.

**Nontron**, Fr. tn. cap. of an arron., in the dept of Dordogne, on the Bandiat. It has a busy market. Pop. 3200.

**Noon**, Malik Firoz Khan (1893- ), Pakistan statesman and lawyer, b. Lahore, son of Nawab Sir Malik Mohammed Hayat Khan N., educ. at Chiefs' College, Lahore, and Wadham College, Oxford. He was successively advocate at Lahore high court, 1917-26; member of the Punjab legislative council, 1920-36; minister for local self-gov., Punjab gov., 1927-30; minister for education in the Punjab, 1931-1936; commissioner for India in the U.K.,

1936-41; member of the viceroy's executive council, 1941-5; labour member of the governor-general's executive council, India, 1941-2; and defence member of the governor-general's executive council, 1942-5. Knighted in 1933, N. was a delegate from India to the San Francisco Conference, 1945. In 1946 he renounced his title, in common with the other leading figures in the Muslim League. Later he became a member of the legislative assembly of the W. Punjab till 1950, and has been governor of E. Bengal since then.

**Noordholland**, see NORTH HOLLAND.

**Noordzeekanaal**, see NORTH SEA CANAL.

**Noort (or Oort)**, Adam van (1557-1641), Flem. painter, b. Antwerp. Among his many pupils were Rubens and Jordaens. He had considerable ability, especially as a colourist, and was an admirer of the Venetians. He became a member of the guild of St Luke in 1587.

**Nootka**, tribe of the Wakashan stock of N. Amer. Indians. They dwell on the W. coast of Vancouver Is., near Nootka Sound. They number about 2000, and were famed as whale catchers. See E. Colson, *The Makah Indians*, 1953.

**Nootka Affair** (1788-90), an incident in the hist. of Anglo-Sp. colonial rivalry. In 1788 Capt. John Meares, an aggressive Eng. maritime trader, erected a store building on Nootka Is. and built a 30-ton schooner, the *North-west America*, the first ship launched on the Brit. Columbia coast. His obvious intention to trade there permanently moved the Spaniards to interference and, in the spring of 1789, a 20-gun Sp. warship appeared off the is. Its commander, Don Joseph Martinez, seized the *North-west America* and other Brit. vessels there and constructed fortifications. Meares appealed to the Brit. Gov., which at once decided to force Spain to a settlement. The Spaniards eventually restored Meares's property and, furthermore, agreed that Brit. subjects should have trading and colonising rights N. of the 38th parallel of lat. This amounted to an admission that Spain had modified her age-long exclusive claims to the Amer. Pacific coast.

**Nootka Language**, see NORTH AMERICAN NATIVE LANGUAGES, *Pacific Areas*.

**Nootka Sound**, harbour of the Pacific coast of Canada, lying behind Nootka Is. on the W. coast of Vancouver Is. N. S., Barclay Sound on the SW. coast of Vancouver, and Quatseanough Sound on the NW. coast all send branches into the heart of Vancouver Is.

**Noranda**, city of Quebec, Canada, adjoining Ronyn, 420 m. NW. of Montreal. The prin. industry is the smelting and refining of gold and copper ore. Pop. 10,000.

**Norba Caesania**, see CACERES.

**Norbert**, St (c. 1080-1134), was b. of a princely family at Xanten. He led a worldly life at the Ger. court and received holy orders for the sake of material advancement. In 1115, however, a narrow escape from death brought about his conversion. After trying to reform the chapter of canons at Xanten he became an itinerant preacher. Given the ter. of

Prémontré near Laon in 1120, he estab. a community of canons regular under the Augustinian rule, since known as Premonstratensians or Norbertines. His new order quickly spread over W. Europe. N. himself, compelled to accept the see of Magdeburg, began the reformation of his clergy, by force when necessary. He defended the doctrine of the Real Presence and fostered the cult of the Blessed Sacrament. N. was canonised in 1582; his feast is on 6 June.

Nord, most northerly dept of Franco, adjoining Belgium, and with a short coastline on the N. Sea. It is formed of the anct prov. of Fr Flanders (see FLANDERS). The greater part of the surface is flat, fertile, and well cultivated, watered by the Scheldt and the Sambre. Wheat, oats, potatoes, sugar-beet, flax, chicory, and some tobacco are the chief agric. products. The Fr.-Belgian coal-field is the centre of the prin. industrial area in Franco. Apart from coal-mining, N. has textile, metallurgical, chemical, and food-stuff industries. Fishing is important in the coastal areas. The prin. tns are Lille (the cap.), Avesnes, Cambrai, Douai, Dunkirk, Valenciennes, Roubaix, Tourcoing (q.v.). Area 2228 sq. m.; pop. 2,099,000.

Nord Fjord, inlet on the W. coast of Norway, extending for about 50 m. inland. The scenery is beautiful.

Nord-Trøndelag, co. of Norway, with a short Atlantic coastline near the Vikten ls. Long fjords include Trondheim, the latter traversing almost half the co. Agriculture, forestry, and fishing are the chief occupations. Area 8659 sq. m.; pop. 109,900.

Nordal, Sigurdur (1886- ), Icelandic scholar of international repute. He was for 30 years prof. of Icelandic literature in the univ. of Iceland.

Nordalbingia, see DITHMARSHEN.

Nordau, Max Simon (1849-1923), Ger.-Hungarian physician and author, b. Budapest, of Jewish descent. He practised medicine in Budapest and later settled in Paris as a physician. Turning to literature, he wrote novels and plays in a satirical vein to illustrate his social theories, but he is more widely remembered for his analytical studies of contemporary society, notably *Die konventionellen Lügen der Kulturmenschheit*, 1883, *Paradox*, 1885, *Die Krankheit des Jahrhunderts*, 1887, and *Degeneration* (an attempt to relate genius to degeneracy), 1892-5. In these and other critical studies of modern society N. applies the theories of Lombroso (q.v. and also CRIMINOLOGY) to which he was strongly attracted. His other works include the plays *Der Krieg der Millionen*, 1881, *Das Recht zu Lieben*, 1892, and *Doktor Kohn*, 1898, and essays *Von Kunst und Künstlern*, 1905, and *Zionistische Schriften*, 1909, 1923.

Norddeutscher Lloyd (N. Ger. Lloyd), Ger. steamship line, inaugurated by H. H. Meier, of Bremen, who in 1857 induced the various shipping industries of the tn to amalgamate under the name of the N. L. In 1881 the first of the company's Atlantic service express steamers was

built. From the H.Q. at Bremen many steamers ran to New York, Baltimore, Brazil, Galveston, the R. Plate, etc. Mail steamers ran between Bremen and America, Asia, Australia, etc., and there was also a Chinese coasting trade. In 1914 the company had 135 sea steamers and auxiliary craft totalling nearly 1,000,000 tons gross. After 1919 all that remained of the great mercantile fleet were the seaside steamers, lighters, and tugs; but a surprising recovery was effected, and such large ships as the *Bremen* (burnt at Bremerhaven), the *Europa* (now the Fr. *Liberté*), and the *Columbus* (sunk in 1939) were built. Before the Second World War the total tonnage was nearly 615,000. After the Second World War the company's fleet was reconstructed, and in the N. Atlantic service the S.S. *Berlin*, and in the Far E. service the new combined passenger/freight motor vessels *Schwaabenstein*, *Hessenstein*, and *Bayernstein* were put into service. At its centenary, 20 Feb. 1957, the company was operating 40 sea-going vessels (gross tonnage approximately 280,000).

Norden, John (1546-1625), topographer and surveyor. According to Anthony Wood, N. was b. 'of a genteel family,' but there is not sufficient evidence to confirm that he belonged to Wilts, and more probably his father was a native of Middx. A privy council order of Jan. 1593, addressed to lieutenants and other co. officers, declared that 'John Norden, gent., was authorised and appointed by the Queen to travel through England and Wales and make descriptions, charts and maps,' and the outcome of this order was his first work *Speculum Britanniae, first parte: Middlesex*, 1593. N. was the first to project a complete series of co. hist.s, but he was prevented by monetary difficulties from completing this design. He pub. *Herefordshire* in 1598, and completed in MS. *Essex, Northampton, Cornwall, Surrey, and Kent*. He was surveyor of crown woods, 1600; surveyor to the Duchy of Cornwall, 1605; and, in 1607, surveyed Windsor and its neighbourhood. He pub. *Observations concerning Crown Lands and Woods* in 1618. He engraved a number of maps, in which roads were indicated for the first time. His maps of London and Westminster were dated 1593, but are somewhat later than those of Aggas and van den Wyngaerde. By the aid of these maps we can obtain a very fair notion of the extent and major features of Tudor London. His *Surveyor's Dialogue* (printed 1607 and reprinted 1618) is among the more meritorious of the earlier works on agriculture. The first 3 books deal with the now more or less obsolete rights of the lord of the manor and the various old forms of land tenure, together with the obligations they involved. The later parts are characterised by shrewd observations on the 'different natures of grounds, how they may be bettered, employed, and amended.' He was also the author of several religious works.

Nordenskiöld, Adolf Erik, Baron (1832-



1901), Swedish geographer and explorer, b. Helsingfors, Finland. After sev. successive voyages and explorations with Tonelli in the Arctic Sea, with frequent visits to Spitsbergen, where he measured an arc of the meridian, in 1878-9 he navigated the N.E. Passage by traversing, along the N. shores of Europe and Asia, the whole Arctic from the Atlantic to the Pacific. He contributed to the science of geographical research, particularly in his work *Perillus*, 1897. His pubs. in English include *The Voyage of the 'Vega' around Asia*, 1881, and *The Second Swedish Expedition to Greenland*, 1885. A series of scientific results of the *Vega* expedition were pub., 1882-7. See life by S. Hedin, 1928.

His nephew, *Nils Otto Gustaf Nordenskjöld* (1869-1928), explored the Magellan Straits and Patagonia in 1895-7, and Alaska in 1898; he also led the Swedish expedition which discovered King Oscar Coast, and Nordenskjöld Coast, Graham Land, and Antarctica, 1901-3. A series of scientific results have been pub. since 1911. See life by G. Bodman, 1928, and his *Antarctica*, 1905.

**Norderney**, is. in the N. Sea, in the E. Frisian group, belonging to the *Land* of Lower Saxony (q.v.), Germany. It is a very popular holiday resort. The is. is 8 m. long and about 1 m. wide. Area 9 sq. m.; pop. 6000.

**Nordhausen**, Ger. tn in the dist. of Erfurt, at the foot of the Harz Mts (q.v.), 40 m. NNW. of Erfurt (q.v.). It was a free city of the empire, 1253-1803. The area has potash mines, and there are engineering, textile, and oil industries. Pop. 30,000.

**Nordic**, *Nordism*, denote the tall, blond, dolicocephalic race found mainly in Scandinavia, and, to a lesser extent, in Germany, Denmark, and other countries. The theory that the N.s are a superior race from which all European culture has sprung seems to have originated with Joseph de Gobineau (q.v.), author of *The Inequality of Human Races*, whose pseudo-scientific doctrine found a temporary popularity in the early 20th cent. in the U.S.A. This theory also finds an echo in Carlyle's works, and in Nietzsche's cult of the 'superman.' It was carried further by the Englishman, Houston Stewart Chamberlain, from whose time it had a great vogue in Germany. Nordism then developed as a political weapon of Ger. Imperialism, the Germans being proclaimed by their propagandists as N.s (though only some 20 per cent of Germans can be described as N.), whose mission was to rule all other peoples as being of lower racial value. The extremist advocates of Nordism contend that all great men in hist., science, and art have been N.s, while some even assert that ant. Gk culture was the work of blond N.s who conquered Greece 4000 years ago. One school of N. theorists holds that the N.s are the best of the 'Aryan' races, while others go much further, claiming that Aryan and N. are synonymous (see on this **ARYAN** OR **ARIAN**). In fact, the N. race, as distinct

from the N. type in Scandinavia and other countries, is mythical. The existence of a common N. primitive people has never been estab., and long cents. of interbreeding have produced innumerable blends of N. with other types. The contention that to N.s alone are due the achievements of the European peoples is manifestly fantastic. The Nazis, for their own ends, erected Nordism into a veritable state creed. Slavs were contemptuously regarded as 'subhuman,' while the Jews became the special objects of Ger. animadversion and persecution (see also 'MEIN KAMPF').

**Nordic Council**, also known as the **Northern Council**, an assembly of elected representatives from the Scandinavian parliaments estab. in 1952 to foster closer co-operation between Scandinavian countries. Denmark, Norway, Sweden, and Finland each send 16 delegates, and Iceland 5. The aim of the N. C. is not so much the attainment of full uniformity, but a state of affairs whereby the Scandinavian countries can constitute an integrated area within which the citizens may move, live, and work while enjoying equal treatment regardless of nationality. The members of the N. C. have no authority to make decisions on behalf of their respective govts. The procedure is to discuss questions of common interest, and then to forward recommendations to the govts. concerned. The govts. then report to each ordinary session of the N. C. on the measures taken in pursuance of recommendations. Good results have been achieved, especially in social welfare, including a convention allowing any Scandinavian citizen, if resident outside his own country, to enjoy the same social security benefits as those enjoyed by the citizens of that country. A joint labour market has been estab., which allows a Scandinavian to apply, without formalities, for work in any country. In 1952, as a result of the N. C.'s recommendations, passport regulations were abolished between the Scandinavian countries. In the legal field each country now recognises the criminal and civil verdicts pronounced in other countries. Up to and including 1957 the N. C. has met each year since its inception.

**Nordic Runes**, see **RUNES**.

**Nordland**, coastal co. of N. Norway, having a length of 300 m. The Lofoten Is. (q.v.) and other is. fringe the coastline which is particularly beautiful. Narvik and Bodø (on Salt Fjord) are the chief tns. Fishing and mining are among the prin. occupations. At Mo i Rana Norway's first large steel plant came into operation in 1955. Area 14,727 sq. m.: pop. 221,600.

**Nördlingen**, Ger. tn in the *Land* of Bavaria (q.v.), 72 m. NW. of Munich (q.v.). It was once a free city of the empire, and an important tn of N. Swabia (q.v.); and it has remarkable walls, 2 fine Gothic churches, and a 13th-cent. tn hall. The Swedes suffered a reverse near by in 1634, during the Thirty Years War (q.v.). There are beer and leather manufs. Pop. 14,000.

**Nordrhein-Westfalen**, see NORTH RHINE-WESTPHALIA.

**Nore**, The, sand-bank at the mouth of the R. Thames (q.v.), marked by numerous buoys and, formerly, also by lightships. In the Second World War a series of 7 Maunsell towers were erected in the vicinity of the Nore as part of the Thames defences, and the lightship stationed at the E. end of the sand-bank, N.E. of Sheerness, was removed. These defences were demolished between 1956 and 1958. Hamblin placed the first lightship here in 1732. The Nore mutiny took place in the vicinity in 1797.

**Norfolk, Dukes of**, see HOWARD.

**Norfolk, Hugh Bigod**, 1st Earl of (d. 1176 or 1177), noble, received his earldom as a reward for his assistance to Stephen in obtaining the Eng. crown. He was noted for his treachery and double dealing, even in the faithless age in which he lived. In 1169 he was one of the nobles excommunicated by Becket, and in 1175 forfeited his castles for his part in the 1174 rebellion. He probably d. in Palestine.

**Norfolk, Roger Bigod**, 2nd Earl of (d. 1221), noble, son of the 1st Earl of N. He was in favour throughout Richard's reign, being ambas. to France on one occasion. He retained his power during John's reign, save for a short interval in 1213, but was excommunicated by Innocent III as one of the 25 executors of Magna Carta. On the accession of Henry III he regained his honours, and his hereditary right to the stewardship of the royal household was recognised.

**Norfolk, Roger Bigod**, 4th Earl of (d. 1270), marshal of England. He was prominent in the promulgation of the Provisions of Oxford, but later the dissensions of the barons caused him to transfer his allegiance to the side of the king. In 1265 he was one of the 5 earls summoned to Parliament.

**Norfolk, Roger Bigod**, 5th Earl of (1245-1306), marshal of England, one of the leaders of the nobles in their struggle against Edward I. He and Bohun, Earl of Hereford, were foremost in refusing to go on foreign service unaccompanied by their sovereign. In 1297 they secured the confirmation of the charter, which was ratified by Edward at Ghent, and in 1301 signed by him in person.

**Norfolk**: 1. Maritime co. of E. England, on the N. Sea, bounded N. and N.E. by the N. Sea, S.E. and S. by Suffolk, W. by the Isle of Ely (Cambridge) and Lincs, and N.W. by the Wash. Norfolk is rich in prehistoric remains. The co. originally formed part of E. Anglia and suffered many incursions from the Danes. There are many fine churches, among them the beautiful Norman cathedral at Norwich, originally part of a Benedictine monastery. The vil. churches of the Norfolk marshland are notable for both their beauty and their length; among these may be mentioned Walsoken, Emmeth, and W. Walton, all near Wisbech; Terrington St Clement and Tilney All Saints nearer King's Lynn; and Walpole St Peter, especially noted for its embattled parapets and its gargoyles. At Castle Rising there is a fine Norman

church and the ruins of a Norman castle; Norwich Castle is still well preserved. Other interesting feudal and monastic ruins are Castle Acre, Bacton Abbey, and others. At Walsingham (q.v.) there are ruins of an Augustinian priory, and the shrine of Our Lady of Walsingham is visited by great numbers of pilgrims.

Blickling Hall, a magnificent Jacobean house built 1619-24 (see under ARCHITECTURE, *The Renaissance* and BLICKLING), is 9 m. S. of Cromer. The coastline, is mainly flat and low, and has suffered much from erosion, though previously thousands of acres of land were reclaimed from the Wash around King's Lynn. There are few inlets, and owing to numerous sand-banks the coast is dangerous. Inland the surface is mostly level, and includes in the W. part of the Fen (q.v.) country known as the Bedford Level. The prin. rivs. are the Yare and the Great Ouse, with their tribs. A feature of the co. are the 'brouds' (q.v.), a series of beautiful lakes famous for fishing and for water fowl, and for boating, ann. regattas being held. The many windmills which once stood in this area are now largely derelict and have been replaced by power-driven plant. The soil is varied, chalk, sand, and loam being prevalent in different dists. Agriculture flourishes, oats, wheat, and barley being grown in great quantities. Cattle are extensively reared, and green crops include turnips and swedes; beans are grown, and some fruit. Large numbers of turkeys are reared. Building-stone, locally known as 'gingerbread stone', is quarried at and near Snettisham, clay is dug for bricks and tiles at Hunstanton and Snettisham, limestone is quarried at Marham, and flints are worked for facing walls. The prin. manufs. are boots and shoes, and there are a number of flour-mills and mustard works; agric. implements are made; tanning, malting, and brewing are carried on; and there are fisheries at Yarmouth. Norwich is the co. tn; Yarmouth and Lynn are the prin. ports. The mild climate and long stretches of sand have made Yarmouth, Cromer, Hunstanton, and other coast tns favourite resorts. Sandringham is a royal country seat. Norfolk is divided into 6 co. parl. constituencies and 2 bor. constituencies. Area 2053 sq. m.; pop. 376,800 (administrative co. only). See F. Blomefield, *History of Norfolk*, 1739-75; W. Rye, *History of Norfolk*, 1885; W. A. Dutt, *Norfolk*, 1900; *Victoria County History of Norfolk*, 1901-6; A. Mee, *Norfolk*, 1942; R. H. Mottram, *Norfolk*, 1946; E. T. Long, *Norfolk* (revised ed.), 1949.

2. City and port in, but independent of, Norfolk co., Virginia, U.S.A., situated in Hampton Roads (q.v.), one of the finest natural harbours in the world, off Chesapeake Bay. It contains the largest naval base in the U.S.A., with a supply centre and naval air station. The harbour is served by a belt-line railroad connecting 8 trunk lines, and is the N. terminus of the Intracoastal Waterway. The industries include shipbuilding, aircraft components, automobile assembly, farm tools, clothing, soyabean processing, and food products;

and the prin. exports are coal, oil, tobacco, grain, cotton, and vegetables.

**Norfolk Island**, in the Pacific, about 400 m. NNW. of New Zealand, is under Australian Commonwealth Gov. administration. It was first discovered by Capt. Cook in 1774, and was shortly afterwards made a penal settlement. Then it was occupied by the Pitcairn islanders, who, however, soon deteriorated, owing to intermarriage. Some Pitcairn islanders still live in N. I. It is the H.Q. of the Melanesian Mission, which was inaugurated in 1867. The is. is 5 m. long and  $2\frac{1}{2}$  m. broad, and comprises an area of nearly  $13\frac{1}{2}$  sq. m. The soil is fertile,

1st Batt. fought in all the prin. battles of the opening months; the 2nd Batt. joined the Gallipoli expedition, one of its companies marching across country and losing practically every man. This battalion then joined Townshend's ill-starred force in Mesopotamia and, after strenuous exertions, surrendered in 1916 with the rest of the Brit. force besieged in Kut. Other battles in which one or other of the battalions, regular or territorial, fought were the Somme (Delville Wood), Ypres (Poelcapelle), and Bapaume. It became a royal regiment in 1935. In the Second World War one battalion was in Singapore when the is. was taken by the Japanese.



THE NORFOLK COAST: CROMER FROM THE EAST

yielding fruits of all kinds, such as oranges, lemons, figs, grapes, bananas, pineapples, etc. Coffee is also grown. The Norfolk pine (*Araucaria excelsa*) (q.v.) is a splendid tree of giant size. The coast of the is. is steep and rugged, and the highest peak is Mt Pitt (1050 ft). N. I. is a cable station and has a pop. of 942.

**Norfolk Regiment**, The Royal, old 9th Foot regiment, raised in 1685 in the W. of England, but, soon afterwards, designated the 9th (E. Norfolk) Regiment. Of its earlier battles, that of Almanza, though not among its battle honours, is remembered in its annals for the part played in covering the retreat of the Brit. Army under Gen. Stanhope. This exploit is traditionally commemorated by the figure of Britannia in its badge. The regiment fought in most of the great Peninsular battles, and thereafter had a distinguished record in India, Cabool, Moodkee, Ferozeshah, and Sobraon, all being among its honours. In the First World War the

Other units participated in the Burma campaign. The Royal Norfolk and the Suffolk Regiments are to form the new 1st East Anglian Regiment. See F. L. Petre, *History of the Norfolk Regiment, 1665-1918*, 1925.

**Norfolk Spaniel**, see SPANIEL.

**Norge**, see NORWAY.

**Norham**, par. and vil. of Northumberland, England,  $7\frac{1}{2}$  m. from Berwick-on-Tweed, on the R. Tweed, with ruins of a Norman castle (1112) which formerly belonged to the bishops of Durham. 'Norham's castled steep' figures as the opening scene of Scott's *Marmion*. The church is also Norman. Pop. 630.

**Noric Alps**, named after Noricum (q.v.). Rising between the Drave and Mur valleys, they are a part of the E. Alps, extending NE. from the Rhaetian Alps. Eisenhut (8000 ft) is the highest peak.

**Noricum**, Rom. prov. S. of the Danube between Rhaetia and Pannonia (q.v.). It was incorporated in the empire c. 16 BC,

and was an important bastion for the defence of Italy.

**Noril'sk**, tn in N. Siberia, in the Taymyr (q.v.) National Dist., directly subordinated to the Krasnoyarsk Krai authorities; an important industrial centre and one of the main centres of forced labour in the U.S.S.R. There was a large-scale strike of camp inmates here in 1953. In addition to the coal-mining industry, there are uranium, nickel, copper, and platinum works. Founded in the 1930's. Noril'sk became a tn in 1953. Pop. (1956) 92,000.

**Norma** (the 'Rule' or 'Square'), small and unimportant S. constellation between Ara and Lupus.

**Normal**, in geometry, is a straight line drawn from any point on a curve, in its plane, at right angles to the tangent at that point, or a line drawn from any point on a curved surface at right angles to the tangent plane at that point, or a line drawn from any point on a plane at right angles to the plane.

**Normal Schools**, see TRAINING COLLEGE.

**Normal Solution**, in chem., a solution 1 litre of which contains the equivalent in grammes of the dissolved substance. Thus the equivalent of sulphuric acid is 49, so that 1 litre of normal sulphuric acid solution contains 49 grammes of sulphuric acid. Dec., semi-, etc., N. S. contain one-tenth, one-half, etc., of the equivalent weight of the dissolved substance per litre of solution. N. S. are much used in chemical analysis.

**Normal Temperature and Pressure**. For convenience the properties of gases are always given on a standard basis of temp. and pressure which is known as *normal temperature and pressure* (N.T.P.). The temp. is taken as 0° C. and the pressure as the equivalent of 760 mm. of mercury (about 14.7 lb. per sq. in.).

**Norman, Sir Henry Wylie** (1826-1904), Eng. field marshal. He took an active part in the Indian mutiny, being present at Delhi and at the relief of Lucknow. He was made governor of Jamaica in 1883, governor of Queensland in 1888, and governor of the Royal Hospital, Chelsea, in 1901. He was made a field marshal in 1902. See memoirs, 1908.

**Norman, Montagu Collet**, 1st Baron (1871-1950), financier and banker, son of F. H. Norman, banker. Educ. at Eton and King's College, Cambridge, he served in the S. African war, and afterwards became a partner in the family banking business and, in 1907, a director of the Bank of England. In 1920 he was made governor of the Bank of England, a post from which he retired in 1944, and a privy councillor in 1923. It was during his governorship that Britain, in common with other countries, after the First World War went off the gold standard, but in 1925 returned to the gold standard so far as foreign payments were concerned, despite the strong condemnation of the policy by Lord Keynes (q.v.). In 1931, however, when the financial and economic position had further deteriorated, gold payments were once more suspended and the gold standard has never since been restored (see

FREE EXCHANGE and GOLD STANDARD). During the period of his governorship N. was responsible for sev. important financial negotiations, notably those with the U.S.A. in 1923 which resulted in the agreement for the funding of the debt of £978,000,000 to the U.S.A. (see BALDWIN OF BEWLEY, STANLEY, 1st EARL and BANK OF ENGLAND). See Sir H. Clay, *Lord Norman*, 1957.

**Norman**, name given to the people of Normandy and their descendants in the European countries conquered by them. The word is identical with Northman or Norseman, but is mostly restricted to the mixed race which came into existence after the conversion of the heathen Norse settlers and their adoption of Fr. culture. Besides invading and conquering England in the 11th cent., the N.s. conquered and settled in S. Italy and Sicily, where they developed a notable civilisation. See also NORSEMEN.

**Norman Architecture**, see ARCHITECTURE (5) and ENGLISH ARCHITECTURE.

**Norman Conquest**, name given to the conquest of England by William of Normandy, made possible by his victory at the Battle of Hastings (q.v.), 14 Oct. 1066, and to the gov. subsequently imposed upon the country by him and his successors. For events leading up to the Conquest see EDWARD THE CONFESSOR; HAROLD II; WILLIAM I. The opening years of William's Eng. rule were insecure and he was dependent to a fair extent on the co-operation of men who had previously served Harold. But by about 1072 his hold on the kingdom was finally estab. *Domesday Book* (q.v.) shows to what considerable extent the Normans had become owners of the land within only 20 years of Hastings. The affairs of Church and State were completely in Norman hands; yet the break with the past was very far from complete, for William continued, or adopted, many estab. A.-S. institutions for the greater stability of his own system. One basic difference was the introduction of feudal land tenure, for, in spite of superficial similarities, the Saxon system was not built on the feudal essential, namely the granting of a definite piece of land in return for definite services.

The Conquest brought England more closely into the European stream of political affairs and religious thought: but a heavy price was paid in the obliteration of a society, which, for all its many weaknesses, possessed a cultural inheritance without parallel in Normandy. See E. A. Freeman, *The Norman Conquest*, 1867-79; F. M. Stenton, *English Feudalism, 1066-1166*, 1932, and *Anglo-Saxon England*, 1943.

**Norman-French**, Fr. dialect which originated after the settlement of the Norman invaders, under Rollo, in Normandy, c. 911. N.-F. was prominent in the growth of O.F. literature, and can be read in the 12th-cent. chronicles of Wace. It was introduced into England at the Conquest, but its development in England was largely independent of foreign influence, and the Eng. version is also known as

Anglo-French, differing from N.-F. as spoken in Normandy by the use of Saxon words for ideas for which there was no Fr. equivalent. In England, N.-F. ceased to be a spoken language after 1400, but it was the language of the court for sev. cents., and was used for law reports until the middle of the 16th cent.; indeed, certain law phrases and legal words have been incorporated into English. On the whole, N.-F. exercised a considerable influence on the development of the Eng. language. In 1362 a statute ordained that pleadings should be in English, but should be enrolled in Latin; but the language of the statute book was still French in 1483. The earliest important treatise in N.-F. is *Britton*, 1291, and the latest *Littleton*, 1481. N.-F. is still spoken among the native pop. of the Channel Is. (q.v.). A considerable amount of literature, poetry, and prose, in N.-F. has been preserved. See W. W. Skent, *Principles of English Etymology* (2nd series), 1891.

Norman Island, see LEEWARD ISLANDS.  
Norman-Noruda, Wilma, see HALLÉ, LADY.

Normanby, Marquess of, see BUCKINGHAM and NORMANBY, DUKE OF.

Normand, Henri René Le, see LENORMAND.

'Normandie,' until 1943 largest Fr. merchant steamship (less in tonnage than the *Queen Mary* and *Queen Elizabeth*, but longer than both), belonging, until the Second World War, to the Compagnie Générale Transatlantique, was completed in 1933 at a cost of £10,000,000. She had a tonnage (gross) of 79,280, with a displacement of 53,000 tons; quadruple screw; length, 1029 ft; beam, 119½ ft; depth, 91·8 ft; speed, 28½ knots. The *N.* crossed the Atlantic (Bishop Rock to Ambrose Light) in 1935 in 4 days 3 hrs 2 min. and in 1937 in 3 days 23 hrs 2 min., which time, however, was beaten by the *Queen Mary* in 1938 (3 days 21 hrs 45 min. and 3 days 20 hrs 42 min.). She was taken over during the Second World War by the Amer. Gov. for conversion into a troopship and renamed *Lafayette*. But, while lying at her Hudson R. pier, she caught fire on 9 Feb. 1942, through the carelessness of a workman with his torch, and capsized from the hundreds of tons of water that had been poured into her to put out the flames. The charred hull was not finally raised until Aug. 1943 and the estimated total cost of the complicated and protracted salvage operations, including the pumping out of the ship, was \$3,759,000.

Normandy (Fr. *Normandie*), formerly a prov. in the N. of France bordering on the Eng. Channel, now divided into the depts of Seine-Inférieure, Eure, Orne, Calvados, and Manche. It is in general a very fertile, richly cultivated land, resembling a garden in many dists. Its chief agric. products are corn, flax, hemp, colza, and fruits (from which cider is largely made); its fisheries and manufs. are of great importance and its horses the best in the country; sheep and dairy-farming are important industries. There are iron mines near Caen. The prin.

tns are Rouen, Dieppe, Le Havre, Harfleur, Honfleur, Caen, Falaise, St Ló, Bayeux, Coutances, Avranches, Alençon, Evreux, Cherbourg, and Mont-St-Michel.

In the time of the Romans the country bore the name of Gallia Lugdunensis II. Under the Frankish monarchs it formed a part of Neustria, and was first called N. after Charles the Simple, in 912, had given it to Rolf or Rollo, the leader of a band of Norse rovers (see NORSEMAN), to be held by him and his posterity as a fief of the Fr. crown. His descendant, William II, son of Robert II, became Duke of N. in 1036, and in 1066 estab. a Norman dynasty on the throne of England (see NORMAN CONQUEST; WILLIAM I, THE CONQUEROR). In 1077 his eldest son, Robert, wrested N. from him, but it was again united to England under Henry I in 1105. Henry II, the son of Henry I's daughter, Matilda, after the death of Stephen of Blois, obtained in 1154 the gov. of England and N.; but in the reign of his son, John Lackland, it was conquered by Philippe Auguste (1203-4). It remained a portion of the Fr. monarchy for more than 200 years, but after the battle of Agincourt (1415) it was reconquered by the English, who held it till 1449, when it was finally wrested from them by Charles VII. In 1870 N. was partly occupied by the Germans, and in the First World War was the prin. base of the British.

N. suffered severely during the Second World War, particularly in the campaign of 1944, and many famous tns, such as Le Havre, Caen, and Lisieux, were almost destroyed. In most of the devastated areas, however, attempts were made to palliate the ravages of war as soon as peace was restored, and since then reconstruction has proceeded steadily. For a full account of the battle of N., 1944, see under WESTERN FRONT IN SECOND WORLD WAR. See P. de Felice, *La Basse-Normandie*, 1907; H. Prentout, *La Normandie*, 1910, and *Essai sur les origines et la formation du duché de Normandie*, 1911; P. Dearmer, *Highways and Byways in Normandy*, 1924; R. Elston, *Travels in Normandy*, 1930; A. H. Brodrick (ed.), *Normandy*, 1947; Ralph Dutton, *Normandy and Brittany*, 1953; the Earl of Onslow, *The Dukes of Normandy*, 1948.

Normans, see NORMAN; NORMANDY; NORSEMAN.

Normanton, tn in the W. Riding of Yorks, England, situated on the Calder, 24 m. from York. Besides an old Norman church there are traces of a Rom. encampment in the vicinity. There is a grammar school of the 16th cent. N. is an important railway junction, and has railway workshops and coal-mines. Pop. 18,900.

Norns, Scandinavian name for 3 maidens who in Norse mythology symbolise the past, present, and future; they are called Urd, Verdandi, and Skuld. They weave man's destiny and water the root of Yggdrasil, the tree of life, from the Holy Urdar Fount (cf. the Gk Moirae).

Norodom Sihanouk, Prince (1922- ), ex-King and ex-Prime Minister of Cambodia (q.v.), noted for his unconventional political behaviour. As King of Cambodia

he proclaimed his country independent in 1945, but remained on the throne when the French returned. While on a visit to the U.S.A. in 1953 he made a forthright public speech demanding independence for Cambodia. On his return he left his cap. to live in Thailand until Cambodia was independent. Asked by the Thai Gov. to leave, he returned, not to Phnom Penh (q.v.), but to Siem Reap (q.v.). Prince N. S. abdicated in favour of his father, Norodom Sumarit, who became king in Mar. 1955, and then founded a political party which was elected with an overwhelming majority. Prince N. S. became Prime Minister of Cambodia, but has since resigned. He remains the most powerful and popular political leader in Cambodia.

**Noronha, Fernando de**, see FERNANDO DE NORONHA.

**Norrbotnen**, northernmost and largest co. of Sweden, bordered by Norway, Finland, and the Gulf of Bothnia, and including a part of Lapland. There are iron mines at Gellivare, as well as many forests, the lumber being carried on the numerous lakes and rivers. Area 40,754 sq. m.; pop. 250,400.

**Norris, Charles Gilman** (1881-1945), Amer. novelist, b. Chicago, brother of Frank N. (q.v.). From 1908 to 1913 he was art editor of the *American Magazine*. His novels deal with such themes as hereditary influences, eugenics, modern education, business morality, and the place of women in business. They include *Amateur*, 1915, *Sall*, 1917, *Brass*, 1921, *Bread*, 1923, *Pig Iron*, 1925, *Seed*, 1930, *Zest*, 1933, *Hands*, 1935, *Bricks Without Straw*, 1938, and *Flint*, 1944.

**Norris, Frank** (1870-1902), Amer. novelist, b. Chicago. He attended courses at the univs. of California and Harvard, and while a student began his first ambitious realistic novel, *McTeague*, which appeared in 1899. When he left Harvard in 1895 he became a newspaper correspondent in S. Africa, where he contracted fever, and the results of this so weakened his constitution that he d. 7 years later. N. was something of a mystic, contemplating the 'elemental' passions which he transmitted to his characters, and he had an epic mind able to grasp the spirit of America. He planned to write a trilogy on the battle of Gettysburg. This work was never written, nor was the last part, *The Wolf*, of his 'Epic of the Wheat,' of which the first 2 parts, *The Octopus* and *The Pit* appeared in 1901 and 1902 respectively. The second vol. of this trilogy, *The Pit*, had an enormous vogue in its day. It dealt largely with the speculation in grain in the Chicago wheat pit. His Californian novels are *Moran of the Lady Letty*, 1893, *Blix*, 1899, *McTeague*, 1899, and *A Man's Woman*, 1900. He also wrote a critical work, *The Responsibilities of the Novelist*, 1903.

**Norris, John** (1657-1711), philosopher and poet, b. Collingborne-Kingston, in Wilts. He was rector of Bemerton, near Salisbury, for 20 years. He was an idealist and a student of Plato and Malebranche. His pub. works include *Poems*

and *Discourses occasionally written*, 1684, *A Collection of Miscellanies*, 1687, *An Account of Reason and Faith in relation to the Mysteries of Christianity*, 1697, *An Essay towards the Theory of the Ideal or Intelligible World*, 1701-4, and *A Philosophical Discourse concerning the Natural Immortality of the Soul*, 1708. He also trans., in collaboration with Francis Digby, Xenophon's *Cyropædia*, 1685. See F. J. Powicke, *A Dissertation on John Norris*, of Bemerton, 1894, and F. I. MacKinnon, *The Philosophy of John Norris of Bemerton*, 1910.

**Norris, Sir John** (c. 1547-97), Eng. soldier, a son of Henry N., baron N. of Ryecote. He served as a volunteer under Adm. Coligny in the Fr. civil wars and in the disastrous undertaking of the Earl of Essex to colonise Ulster. N., in a vain effort to improve the fortunes of Essex, advanced against the Scottish allies of the Irish in the is. of Rathlin and massacred the islanders who had all taken refuge in the castle there. He served in the Low Countries from 1577 to 1585 at the head of another party of Eng. volunteers fighting on behalf of the states-general in their revolt against their Sp. rulers. N. showed exceptional prowess in the relief of Steenwyk, which was besieged by the Spaniards under Count von Rennenberg. He was sent again to Ireland in 1585, but this did not offer a wide enough field for his ambition. The news that the Spaniards were besieging Antwerp aroused all his ardour on behalf of his former allies and he returned to the Netherlands in 1588 as ambas. In the following year he commanded, with Drake, the fleet that ravaged the coasts of Spain and Portugal, and in 1591 he served Henry IV of France in his conflict with the League in Brittany. N. returned to Ireland (1597) to aid in reducing Tyrone. After fighting and negotiating with the O'Neills in Ulster and warring in Connaught, which he failed to pacify, he asked to be recalled. This was refused, but he was superseded in his military command.

**Norris, Sir John** (1660?-1749), Brit. admiral. He distinguished himself under Shovell in the battle off Malaga (1704) and in the taking of Barcelona in 1705, for which services he was knighted, as well as receiving a sum of 1000 guineas. In 1739 he was appointed admiral and commander-in-chief of the Eng. fleet. He retired from active service in 1744.

**Norris, Kathleen**, née Thompson (1880- ), Amer. novelist, b. San Francisco. Educ. at the univ. of California, she married Charles Gilman N. (q.v.) in 1909. Her pleasantly sentimental novels include *Mother*, 1911, *Saturday's Child*, 1914, *Sisters*, 1919, *The Sea-Gull*, 1927, *Second Hand Wife*, 1932, *Secret Marriage*, 1936, *High Holiday*, 1949, and *Miss Harriet Townshend*, 1955. *Noon*, 1925, is an autobiography, and *Mary-Jo*, 1952, is a convent school story.

**Norristown**, bor. of Montgomery co., Pennsylvania, U.S.A., on the Schuylkill R., 18 m. NNW. of Philadelphia. There is a good trade in textiles, important iron works, and manufs. of furniture,

clothing, plastics, drugs, food and dairy products, and bricks. Pop. 33,126.

**Norrköping**, tn and port of Sweden in Ostergötland, 113 m. from Stockholm, on both banks of the R. Motala. The tn is modern in appearance. There are paper, textile, and cotton mills as well as ship-building yards. Pop. 88,871.

**Norrland**, see SWEDEN.

**Norse Languages.** This group of languages, also known as Scandinavian or N. Germanic, is a sub-branch of the Germanic main branch of the Indo-European (q.v.) family of languages. Norse may be subdivided into 3 periods:

(1) Primitive or Early Norse, termed in Scandinavian languages *urnordisk*, spoken till c. AD 700 in central and S. Scandinavia, in Denmark and N. Slesvig, and partly also in Finland and Estonia. This language is preserved in about 100 runic inscriptions in the early 24-letter alphabet (see RUNES); and sev. hundred loan words penetrated into the Finnish and Lappish languages; instances are: Finnish *kuningas*, 'king' (Ger. *König*); Finnish *kulta*, 'gold' (Ger. *Gold*); Finnish *kauunis*, 'beautiful' (Gothic *skauuns*, Ger. *schön*). It appears to have been fairly homogeneous throughout the whole ter. Its nearest relation was Gothic (q.v.), and both groups are still considered by some scholars as forming a linguistic main group, termed *E. Germanic*, whereas the other Germanic groups of languages (including English and German) were called by these scholars *W. Germanic*. This subdiv., however, is nowadays rejected by the experts. In the 1st cent. AD Primitive Norse began to differentiate from the other early Germanic languages, but it still preserved the early Germanic vowels and endings.

(2) The second main period, known as Viking Norse (AD 800-1100), is the period of vital phonetic changes and of the development of the various dialects. Already in the 8th cent. Norse had undergone a considerable transformation, and at the end of this cent. Primitive Norse must be considered as non-existent, although the Scandinavians themselves still considered their language (then called *Dansk tunga*, 'Danish tongue') as one and the same. At that period, however, the Norse stock of phonetic sounds reached between 30 and 40, and consequently the common Teutonic runes became inadequate to represent all the sounds. Therefore it became the habit to represent different but allied sounds (such as *k* and *g* or *t* and *d*) with the same rune, and owing to this confusion of spelling some of the runes began to fall into disuse; from c. AD 800 a system of 16 runes (reduced from the original 24) came into use; these are known as the Nordic or Scandinavian runes (see RUNES). It was the period when Norse seamen, the Norsemen or Northmen, known as Vikings, or 'sons of the fiord,' descended from the coasts of Denmark, Norway, and Sweden, to ravage and plunder on the N. seas and off the coast of Great Britain. By the middle of the 9th cent. they were gaining their spoils as far S. as the waters of the Mediterranean (there and in France they were

called Normans); in the far NW., and perhaps in America (named by them Vinland); and in the SE. they successfully fought against the Slavs of Novgorod and founded a new Russian monarchy c. AD 862. Owing to this extraordinary territorial expansion, the Norsemen brought their dialects to the Orkney Is. and the Shetland Is. (where they were spoken from AD 800 to 1800), the Hebrides and the Isle of Man (800-1450), N. Scotland and parts of Ireland (800-1250), the Faeroes, Iceland, and Greenland, E. England (Northumbria, E. Anglia, and 'the five Danish boroughs': 875-1175), Normandy (900-1100), parts of Russia (862-1300?), and so forth. This territorial expansion certainly contributed to the further differentiation of the language, which we can study in the numerous runic inscriptions and the Scandinavian literature which was then arising. About AD 1000, with the definitive introduction of Christianity, the difference between *W. Norse* (Norway and its dependencies, including Iceland) and *E. Norse* (Sweden, Denmark, and their colonies) was already marked. Generally speaking, *W. Norse* preserved more primitive forms. The 11th cent. witnessed the development of the sub-dialects of *W. Norse* into Norwegian (q.v.) and Icelandic (q.v.) and of *E. Norse* into Swedish (q.v.) and Dan. (q.v.).

(3) While the N. L. of the first 2 periods are mainly preserved in runic inscriptions, the third period, called *Literary Norse*, c. AD 1100-1500, is the period of the great Early Scandinavian literature. Mention may be made of the Icelandic sagas, the great prose epics, celebrating the *skögu-öld*, the epoch of the original colonisation of Iceland, c. 890-1030, and composed in the 12th and the 13th cents. During the third period the N. L. fully developed into the modern Scandinavian languages, each of them having various dialects. These can be classified in the following groups: (i) the dialects of Iceland and Greenland; (ii) the dialects of the Faeroe Is.; (iii) the N. Scandinavian group (N. Norway and N. Sweden); (iv) the W. Norwegian group; (v) Middle Swedish; (vi) the dialects of the is. of Gotland; (vii) S. Scandinavian, including S. Sweden and Bornholm, the Dan. is., and Jutland and N. Slesvig.

**Norsemen**, Northmen, or Vikings, in the strictest sense of the word, denotes the early dwellers in Norway; but the application of the term is sometimes extended to all Scandinavia. Between about 780 and 850 the hunting economy of Norway was strained, and emigration on a large scale took place. This factor was responsible for the Norse invasions of Europe which began on the E. coast of England in the year 787. Known to the English as 'Danes,' they were almost subdued by Alfred the Great; but they controlled England for a time in the 11th cent., under Canute (q.v.). It was at the end of the 8th cent. that they reached the Shetlands, Orkneys, and Hebrides. In Ireland they were also very powerful, and about 840 were masters of most of the northerly part,

founding their kingdom of Dublin. They reached the Faeroe Isles and Iceland about the end of the 9th cent., and from Iceland visited Greenland and thence travelled in the 11th cent. to N. America. They also pillaged the land of the Frisians and Flanders. In 843 they estab. themselves on the R. Loire, and a few years later had planted camps on most of the Fr. riva. They obtained possession of Paris in 845 (sacking the city), and again on 3 later dates. In 859 and 860 they sailed into the Mediterranean Sea, attacking Spain and the is. near and settling on the R. Rhone. Shortly afterwards they arrived in Italy, and continued to plunder tns. In 912 Rollo (q.v.) was made by the Fr. king the owner of the duchy of Normandy (q.v.). But in the S. regions the true Norsemen became absorbed into the alien race. See G. B. Dopping, *Histoire des expéditions maritimes des Normands et de leur établissement en France au dixième siècle*, 1826; O. Delarc, *Les Normands en Italie*, 1883; P. B. du Chaillu, *The Viking Age*, 1889; C. F. Keary, *The Vikings in Western Christendom*, AD 789 to AD 888, 1891; I. Fischer, *Die Entdeckung der Normannen in Amerika*, 1902; Katharine F. Boulton, *Asgard and the Norse Heroes* (Everyman's Library), 1903, 1914; T. D. Kendrick, *A History of the Vikings*, 1930 (with good selective bibliography); T. C. Lethbridge, *Merlin's Island*, 1948.

**Norstad, Lauris** (1907- ), Amer. Air Force officer. Educ. at the U.S. Military Academy, West Point, N. was commissioned in the cavalry, but within a year transferred to the Air Corps. In the Second World War he was chief of staff 12th Air Force in Britain and N. Africa until 1943, then director of operations, Mediterranean Allied Air Force, until 1944, returning to the U.S.A. as chief of staff 20th Air Force at the end of the war. He was promoted lieutenant-general in 1947 and appointed deputy chief of staff. From 1951 until 1956 he was Commander-in-Chief U.S. Air Force in Europe. In 1956 N. succeeded Gen. Gruenthor as supreme allied commander in Europe (S.H.A.P.E.).

**Norte de Santander**, dept. of Colombia, lying in the NE., with Venezuela to the E., the dept. of Magdalena to the N. and W., Santander to the SW., and Boyaca to the S. The cap. is Cúcuta. The industries include subtropical products and petroleum. Area 8297 sq. m.; pop. (1955 estimate) 400,370.

**North**, Eng. family, among whose prominent members are: *Edward N.*, 1st Baron N. (1496-1564), chancellor of the Court of Augmentations, who was raised to the peerage in 1554. *Sir Thomas N.* (c. 1535-c. 1601), man of letters, chiefly distinguished for his trans. of Marcus Aurelius and Plutarch's *Lives*, which latter work was much drawn upon by Shakespeare. *Francis N.*, 1st Baron Guilford (1637-85), a lawyer, solicitor-general, 1671; attorney-general, 1673; chief justice of common pleas, 1675-82; lord chancellor, 1682; raised to the peerage, 1683. *Sir Dudley N.* (1641-91), one of the few important exponents of free trade before Adam Smith. *Roger N.* (1653-1734), a

lawyer, the author of *Lives of the Norths* (Francis N., Sir Dudley N., and Dr John N.), an Eng. classic (issued 1742-4), collected and ed. by Henry Roscoe in 1826 and by A. Jessopp (including Roger N.'s autobiography) in 1890. *Frederick N.* (q.v.), 2nd Earl of Guilford.

**North, Christopher**, see WILSON, JOHN.  
**North, Sir Dudley** (1641-91), economist, son of Dudley, 4th Lord N. He made a fortune in trading with the Levant and subsequently became a commissioner of customs and entered Parliament when, according to his brother, Roger N., he assumed the place of 'manager for the Crown in all matters of revenue.' As an economist he is remembered by his *Discourses upon Trade, principally directed to the cases of the interest, coinage, clipping and increase of money* (pub. anonymously in 1691). This work did not attract notice on its pub. nor does it seem to have been used by subsequent political economists. But it was ed. by J. R. McCulloch for the *Select Collection of Early English Tracts on Commerce*, printed by the Political Economy Club, London, in 1856. N. is highly praised by Wilhelm Roscher (q.v.) who includes his name among those who in the 17th cent. gave England the lead in Europe. Roscher points to the similarity of N.'s work to Adam Smith's classic and the tract does in fact anticipate Adam Smith's doctrines and those of the earlier free trade school to a marked degree, while being free from the prejudices and fallacies of the mercantile system (q.v.).



LORD NORTH

**North, Frederick**, 2nd Earl of Guilford, better known as Lord North (1732-92), statesman, educ. at Eton and Trinity College, Oxford. He entered Parliament in 1754, and was a junior lord of the Treasury from 1759 to 1766, in which year he became joint-paymaster of the forces. In 1767 he became chancellor of the exchequer and leader of the House of Commons in the Grafton administration, and 3 years later he became Prime



**Minister.** He acted as the mouthpiece of the king, who ruled the House of Commons by a group of 'King's Friends,' and, by appeals to his loyalty, induced N. to carry out his will. N. was personally opposed to the Amer. war, but allowed the king to influence him against his better judgment. He resigned in Mar. 1782, but with Fox formed a gov. which lasted from April to Dec. 1783, after which he did not again hold office. He succeeded to the earldom in 1790. See R. Lucas, *Lord North, Second Earl of Guilford, 1732-92, 1923*, and life by W. B. Pemberton, 1938.

**North, Sir Thomas** (c. 1535-c. 1601), translator, second son of the 1st Lord N., is said to have studied at Cambridge. He entered Lincoln's Inn in 1557, but devoted himself to literature rather than to law. He is best known by his classic trans., pub. in 1579, of Plutarch's *Lives of the Noble Grecians and Romans*, from the French of Amyot, who himself had added charm to Plutarch's pedestrian style. N.'s trans. is in a vivid, dramatic, idiomatic English and is a masterpiece beyond either Amyot or Plutarch. It was the repository from which Shakespeare drew his knowledge of anc. hist.: in *Antony and Cleopatra* and *Coriolanus* N.'s language is often followed. Another trans. by N. was from an It. version of an Arabic book of fables, and bore the title *The Morale Philosophie of Dont*, 1570.

**North Adams**, city of Berkshire co., Massachusetts, U.S.A., on the R. Hoosic, 19 m. NNE. of Pittsfield. It carries on cotton and woollen manufs. and also produces electrical goods, shoes, and paper; it has a printing industry. There is a state teachers' college. Pop. 21,567.

**North Africa**, see AFRICA; CYRENAICA; LIBYA; MOROCCO; TRIPOLITANIA; TUNIS.

**North Africa, Second World War, Campaigns in**, see AFRICA, NORTH.

**North America** (Geology; Archaeology; Ethnology)

**Geology.** The oldest part of N. A. lies to the E., the dists. of New England, N. New York, and the Blue Ridge being the earliest parts of the continent to rise above the sea. The dist. is chiefly floored with Archaean formation where it is associated with Cambrian and Silurian beds. The Adirondack Mts and the Appalachian Mts are surrounded by Cambrian and Silurian formations. Scattered here and there are patches of Jura-Trias, some of which contain large deposits of coal. These areas widen further northwards, similar phenomena being found in the Hudson valley. There is also a carboniferous formation, loaded here and there with anthracite coal deposits. Bordering Lake Superior are areas of Algonkian formation in which vast iron-ore deposits are found. Towards the Atlantic are soft Tertiary beds which trend southwards to Florida. In the Appalachian valley are alternate beds of Algonkian, Cambrian, Silurian, and Devonian deposits, bearing evidence of considerable erosion. The Mississippi valley is floored with carboniferous layers containing large quantities of coal, and in SW. Missouri are extensive Silurian areas holding iron and zinc. Of

more recent formation are the great plains of N. A., composed mainly of Cretaceous and Tertiary beds, the oldest formation being Oklahoma, where Jura-Trias predominate. That remarkable region the Cordilleras, reaching through the Rocky Mts group, presents all geological stages from Silurian to Tertiary. The Sierra Nevada is a monoclinical range descending westwards to California, most of it being granite. In anc. times the N. part of the continent was buried under ice during the movement of a great glacier from the N. Traces of this exist as erosion in Canada and deposition in the U.S.A. The great prairies of N. A. are composed of transported soil, mainly loess (q.v.), and form part of a great belt which reaches through Europe to Russia, thence from Turkestan to China, reappearing in N. A. Wind played an important part in the origin of this belt, attacking the finer elements of glacier débris and depositing them over a wide area, where they became modified by water.

The chief feature of Canadian geology is the great area known as the Canadian or Pre-Cambrian Shield or the Laurentian Plateau (see LAURENTIAN ROCKS). This shield is underlain by formations of the Pre-Cambrian age, which occupy nearly the whole of the country E. of a line joining Lake Winnipeg and Great Bear Lake, excepting the Maritime Provs., the S. of Ontario and Quebec, and a part of Ontario adjacent to the S. coast of Hudson Bay. The Pre-Cambrian rocks include the oldest known geological formations. Surrounding this Pre-Cambrian area is a wide extent of flat-lying sedimentary formations of Palaeozoic, Mesozoic, and Cenozoic age. As one approaches the Atlantic and Pacific coasts, the flat-lying sedimentary series yield to great assemblages of folded sedimentary and volcanic rocks pierced by granite bodies and forming the Appalachian system of mts on the E. and the Great Cordillera on the W. In the extreme N. an analogous mt range stretches from Greenland westward into Ellesmere Is. The Pre-Cambrian formations are prolific in mineral deposits of great number, variety, and extent. They occur generally at or near the contact of the intrusives and the intruded rocks, and among them are the gold deposits of Porcupine and Kirkland Lake, associated with intrusions of porphyry, the silver deposits of Cobalt, S. Lorrain, and Gowganda, associated with diabase sills, the vast nickel-copper deposits of Sudbury, associated with norite, the auriferous copper sulphides of W. Quebec, the copper-zinc sulphides of Flin Flon, and the iron ores and iron pyrites of Ontario; in the Grenville-Hastings area are found deposits of galena, mica, graphite, feldspar, magnesite, kaolin, molybdenite, talc, and apatite.

**Archaeology.** The first significant discovery of archaeological remains in N. A. was in 1902, when a skeleton was unearthed at Lansing, Kansas; and in Florida human remains have been found, accompanied by objects of human handiwork; but no definite age has been assigned

to these finds. Mineralised bones were discovered near Osprey, Manatee co., in 1880. The features of the facial bones bear close resemblance to those of Florida Indians. Some remains found near Omaha, identified as the Nebraska Loess man, were found in 1906, accompanied by flint implements. Considerable archaeological finds were discovered in the Los Angeles area, including a number of animal bones of the Quaternary period, and in 1914 a female human skeleton bearing similarity to the Californian Indian was found. Pleistocene remains were unearthed between 1913 and 1916 near Vero, Florida, including fossilised plant remains and vertebrate fossils. Perhaps the most complete Pleistocene skeleton yet found is that of the Lone Wolf Creek, near Colorado, Texas. A similar discovery was made near Folsom, New Mexico, in 1925. The Field Museum expedition in 1931 found traces of 3 distinct cultures at Lowry Ruin, Colorado. The walls show fragments of painting in black and white, and date back 3000 years, having been covered for at least 1000. Prehistoric designs representing sun, rain, lightning, and clouds are apparent, and masonry and pottery show work of a highly developed ancient Indian tribe. In 1954, near Midland, Texas, human bones believed to be of the Pleistocene period were found. An imperial archaeological survey of the Brit. Columbian coast was made in 1938, and much active research followed.

**Ethnology.** The Indians of N. A. are said to have come originally from the E. hemisphere. Hitherto N. A. has yielded no palaeolithic remains either of human beings or human implements. It is reasonable to assume that a migration took place from N. Asia via the Bering Strait. The theory claims some support by reason of the similarity in feature and speech in Eskimo types on both sides of the strait. Indeed Paleo-Asiatic tribes such as the Chukchee and Yukaghir are markedly similar to the Amer. types found among the Dene and Haida tribes, and a Paleo-Asiatic link is pointed out by some authorities with the Amer. Indians (see AMERICAN INDIANS). In E. Siberian races the point of resemblance is greatest.

For geography, climate, products, manufs., forms of gov., hist., etc., see ALASKA; CANADA; UNITED STATES OF AMERICA; and articles on the provs. and states of these countries.

See A. V. Kidder, *Introduction to the Study of South-western Archaeology* (Pecos Excavations), 1924; W. R. Kermack, *New Geography of the World*, 1930; G. J. Miller and A. E. Parkins, *Geography of North America*, 1934; R. Ruedemann and R. Balk, *Geology of North America*, 1939; S. Northey, *The American Indian*, 1939; F. C. Hibson, *Treasure in the Dust*, 1953; and the pubs. of the U.S. Geological Survey. There are details of recent work in the *Digest of American Journal of Archaeology*, being vol. li pub. in 1947.

North American Indians, see AMERICAN INDIANS.

North American Native Languages.

Among the better known larger groups of languages spoken in N. America are Eskimo, now regarded by some scholars as a branch of the Ural-Altaic linguistic family (q.v.), Athabascan, Shoshonean, Algonkin, Caddoan, Iroquois, Muskogean, and Siouan, all of which are considered Amer. Indian or Amerind, or 'Red Indian languages.'

The Eskimo, or Inuit, occupy more than 5000 m. of seaboard, from NE. Greenland to the mouth of the Copper R. in W. Alaska. The numerous Eskimo dialects (respectively spoken in Greenland, Kuskokvim, Labrador, Baffin Land, the Aleutian Is., and so forth) differ very widely, especially in their vocabularies, and employ different alphabets. The Athabascans, subdivided into 2 branches, the N. (Déné or Tinné, meaning 'men') and S. (Navaho, Apache, Hupa), once occupied a wide area in the NW. from the Rockies almost to Hudson Bay, small detachments spreading westwards to Washington, Oregon, and California, and in the SW. (Colorado, New Mexico, and Arizona). Navaho is one of the main languages; it is spoken by some 25,000 people, living in N. Arizona. Hupa is spoken in the ter. lying on the lower Trinity R. in N. California. The Shoshoneans were mainly centred in the region of the Rocky Mts. The Algonkins are much better known: their main linguistic branches are Blackfoot or Siksika, Micmac, Cheyenne, Arapahoe, Cree, which was reduced to writing about 300 years ago, Chippewa or Ojibway, Fox, and Lenni-Lenape and some other languages, which are less important.

The Caddoans live mainly on the Red R. in Louisiana, along the rivs. of NE. Texas, in Kansas, and Nebraska. This linguistic group consists of 4 major languages: Caddo, Pawnee, Wichita, and Kitsai or Kichai. The term Iroquois was originally applied to a group of 5, and later 6, tribes (Mohawk, Onondaga, Oneida, Cayuga, Seneca, Tuscarora), at the time united in a strong confederacy. Cherokee is now the main Iroquoian language; the Cherokees formerly lived in what is now N. Georgia and N. Carolina, but were moved to Indian ter. in 1838-9; they employed their own script, a syllabary which was the most developed writing ever created by an Amer. native. Huron and Attiwandaron are extinct; some other languages, such as Wyandot, are still spoken. Muskogean ter. extends along the rivs. flowing into the Gulf of Mexico parallel to the Mississippi. The following are the main languages belonging to this group: Muskogee or Muskokee, Creek, Seminole, Chickasaw, and Choctaw. Winnebago (Minnesota and Wisconsin) is one of the oldest Dakota languages. The Assiniboin or 'Stone Sioux' is another branch; it separated from the main stock about 300 years ago. An important dialect, originally spoken by a numerous tribe inhabiting Missouri and Arkansas, it is nowadays spoken by only 220 people living in Oklahoma.

**Pacific areas.** The ethnical hist. and linguistic situation of the native pop.

of the 'Pacific slope' are entirely different from those of the rest of N. America. The following are some of the main languages spoken in the extreme W.: Chinook, which embraces a number of closely related dialects originally spoken on both sides of the Columbia R. from the Cascades to the sea; Tillamook, spoken on the Oregon coast S. of the Columbia R.; Kutenai, spoken in the area from about 50° N. lat. to N. Idaho and Montana. Other languages spoken in Brit. Columbia belong to the Wakashan group; there are 3 main dialects, each divided into sub-dialects differing in phonetics and vocabulary, Kwakiutl being one of them. The Salish or Flathead tribes of the coast and the Kalispel constitute the Salishan linguistic group. Tsimshian and Nootka are spoken on the Skeena R. in N. Brit. Columbia and on the Is. further to the S. Takelma was spoken in the SW. of the state of Oregon. Maidu or Pujanen, comprising various dialects, is spoken in N.E. California; Dieguens is spoken in S. California; Pima is spoken in S. Arizona by a semi-civilised tribe; and Zuni is now spoken only by 2000 people on the Zuni reservations in New Mexico. *See under LINGUISTIC FAMILIES. See also LANGUAGES, CLASSIFICATION OF; MEXICAN AND CENTRAL AMERICAN NATIVE LANGUAGES; SOUTH AMERICAN NATIVE LANGUAGES.*

'North American Review,' critical review, reputed to be the oldest magazine in the world. The first number was pub. with Wm Tudor as its editor in 1815. In the 19th cent. practically every notable Amer. writer, together with some of the greatest contemporary thinkers in England, at one time or another contributed to its columns. One of its most celebrated editors was James Russell Lowell (1864-1872). It became a recognised channel in America for the most comprehensive discussions of important public questions. George B. M. Harvey (q.v.) was the owner and editor, 1899-1926. It ceased pub. in 1940.

**North Atlantic Treaty**, signed on 4 April 1949 at Washington by the U.S.A., Great Britain, Canada, France, Belgium, the Netherlands, Luxembourg, Norway, Denmark, Iceland, Italy, and Portugal, by which the U.S.A. associated herself with the W. European countries in security arrangements for their common or mutual defence against possible aggression. The pact had its origins in the hist. of the two years 1947-8, during which failure to come to terms with the Soviet Union and its satellites forced the W. countries to seek economic and security arrangements among themselves. Greece and Turkey were admitted to the treaty, 1951 (effective, 1952), and the Federal Ger. Rep. in 1954. The N. A. T. Organisation (N.A.T.O.) was organised in Feb. 1952, its first secretary-general, Lord Ismay (q.v.), being appointed in Mar. Its H.Q. are in Paris. Spaak (q.v.) was appointed Ismay's successor, taking up his office in 1957. The prin. body of the organisation is the council, on which members are generally represented by their foreign

minister or defence minister and which meets two or three times a year at ministerial level, a permanent representative acting on the minister's behalf at other meetings. In 1950 the council agreed on the estab. of a unified W. European defence force, under a supreme allied commander, with H.Q. near Paris. The first supreme allied commander was Eisenhower (q.v.): the present one (1958) is Gen. L. Norstad (q.v.). In Dec. 1957 the Amer. president (Eisenhower) and the Brit. premier (Macmillan) were among the leaders of gov. who attended the N.A.T.O. conference in Paris, at which agreement was reached in general on the principle of the Amer. offer to supply an atomic stockpile and nuclear weapons to European members of the organisation. *See Lord Ismay, Nato, the First Five Years, 1954.*

**North Australia**, *see* NORTHERN TERRITORY.

**North Battleford**, city of Saskatchewan, Canada, on the N. Saskatchewan R., 100 m. W. of Saskatoon. A distributing centre for a large area in N. central Saskatchewan, N. B. has elevators, stockyards, and mill works, and receives natural gas by pipeline from a neighbouring field. It is the site of a prov. mental hospital. Pop. 7480.

**North Bay**, tn and watering-place of Ontario, Canada, on Lake Nipissing, 190 m. N. of Toronto. N. B. has foundries and machine shops, manufs. railway cars and ships, pulp and paper. There are gold and silver mines in the neighbourhood. Pop. 20,160.

**North Berwick**, seaside resort and royal burgh of Scotland in E. Lothian co., 22½ m. (by rail) ENE. of Edinburgh. It was made a royal burgh by Robert III; the ruins of a Cistercian abbey founded by David I are in the neighbourhood. At the harbour are ruins of a pre-Reformation church. One mile to the S. is the hill called N. B. Law, rising to 612 ft; 3 m. E. of the tn are the ruins of the 14th-cent. Tantallon Castle, whilst 2 m. SW. is Dirleton Castle, built in the 12th cent. It has become popular as a watering-place, having a good beach and fishing, and 2 fine golf-courses. Pop. 4000.

**North Borneo**, *see* BORNEO, NORTH.

**North Brabant**, largest prov. of the Netherlands, in the S. of the country. In the Middle Ages the duchy of Brabant included S. Brabant, which is now a prov. of Belgium (*see also* BRABANT). Cattle are raised, wheat grown, and sugar-beet produced in the NE., though the flat land is generally marshy and unproductive. Reclamation in the SE. has increased the cultivation. There are textile and tobacco industries and the manuf. of incandescent lamps (Eindhoven). The cap. is 's Hertogenbosch. Area 1920 sq. m.; pop. (1954) 1,354,363.

**North Braddock**, bor. of Pennsylvania, U.S.A., in Allegheny co., 9 m. SE. by E. of Pittsburgh. There are manufs. of steel products. Pop. 14,720.

**North Bridgewater**, *see* BROCKTON.

**North Cape**, headland on the is. of Magerøy (q.v.), Norway. It is the most northerly point of Europe, being in lat.

71° 10' 21" N. A road to the N. C. was opened in 1956. The midnight sun is seen from 14 May to 30 July.

**North Carolina** (Tar Heel State or Old N. State), S.E. Atlantic state of U.S.A., bordered by Virginia on the N., S. Carolina on the S., Georgia on the S.W., and Tennessee on the W. The coastal plain, forming about 40 per cent of the state, is fringed by a margin of swamps and shoals which are extremely treacherous to navigation. The largest of these swamps is known as Dismal Swamp. The Piedmont plateau region (45 per cent of the state) is bold and somewhat rugged in contour. The chief ranges of the Appalachian Mt region are the Blue Ridge and the Unaka Mt range. The highest peak of the Unakas is Mt Mitchell (6684 ft). The mts of this region are for the most part clothed with dense forests, which occupy two-thirds of N. C. The scenery is exceptionally beautiful, Asheville being the most famous resort, with a fine golf-course. N. C. is exceptionally rich in minerals, which include clay products, mica, feldspar, barytes, talc, kaolin, asbestos, granite, monazite, zircon, columbite, wolframite, etc. In 1953 mineral products were valued at \$26,343,000. The chief occupation is agriculture. Maize is the prin. crop (65,000,000 bushels in 1947). The chief cash crops are cotton, tobacco, and peanuts. Cultivation of cotton on 619,000 ac. in 1951 produced nearly 550,000 bales. N. C. leads in the production of tobacco (978,620,000 lb. in 1951) and of sweet potatoes. Also grown are peaches and *sorgo* syrup. The ann. lumber cut is about a billion ft, chiefly yellow pine. Tar and rosin are also flourishing trades. The state is first in cotton milling, and leads in cigarette manuf. (70 per cent of the country's production). Also important are the rayon, lumber, paper and pulp, fertiliser, and mining industries. Fisheries in the state are valuable.

The cap. of the state is Raleigh (pop. 65,679); the chief port is Wilmington, the largest city being Charlotte. Other cities are Winston-Salem, Durham, Greensboro, Asheville, and High Point. The state is represented in Congress by 2 senators and 12 representatives. Its General Assembly has a Senate of 50 and a House of Representatives of 120 members, elected for 2 years. N. C. was one of the original 13 states. The ter. was discovered by Amadas and Barlow in 1584, and a colony settled in Roanoke Is. in 1585-6, the famous 'vanished colony' which in 1587 was found to have disappeared without leaving a trace. The ter. was granted to various 'proprietors' by Charles I and Charles II, but in 1728 the Crown resumed control. The pop. consists of over 99 per cent native-born Americans, of whom 27.4 per cent are Negroes. The percentage of illiteracy is still somewhat high, but is being rapidly reduced by compulsory attendance at the schools. There are the state univ. at Chapel Hill and Duke Univ. at Durham, endowed with \$15,000,000 by J. B. Duke, the cigarette millionaire. There are also Davidson College (at

Davidson) and Wake Forest College (at Wake Forest). There are separate schools for white, coloured, and Indian children. There are 12 state-supported teachers' colleges, 6 white, 5 Negro, and 1 Indian. The area of the state is 52,712 sq. m., of which 3570 sq. m. are inland water. Pop. (1950) 4,061,929. See R. D. Connor, W. K. Boyd, and J. G. Hamilton, *History of North Carolina, 1584-1912*, 1919; A. R. Newsome, *North Carolina Manual*, 1929; S. H. Hobbs, *North Carolina: Economic and Social*, 1930; H. T. Lefler, *North Carolina's History told by Contemporaries*, 1934; Federal Writers' Project, *North Carolina: a Guide to the Old North State*, 1939; A. Henderson, *North Carolina, The Old State and the New*, 1941; P. W. Wager, *North Carolina: the State and its Government*, 1947.

**North Dakota**, N. central state of the U.S.A., bounded on the N. by Canada and known as the Northern State, on the S. by S. Dakota, W. by Montana, and E. by Minnesota. The physical features are bold and simple. Three vast tablelands rise successively from E. to W. The Red R. flows through the northernmost of these tablelands, which has a mean breadth of 50 m. and a mean elevation of 900 ft. The second tableland has a mean breadth of 180 m. and a mean elevation of 1400 ft. The third and most westerly tableland is called the Coteau du Missouri, and covers half the state. This plateau is watered by the Missouri. The rainfall is low, and the winters cold but sunny. Devils Lake, or Minniwaukon, in the N.E., has no outlet, and is salt. The valley of the Red R. is very fertile, and produces fine wheat crops. N. D. leads usually in the production of barley, spring wheat, rye, flax, alfalfa, and *durum* wheat. Other important products are potatoes, hay, oats, and maize. Horse and cattle raising flourish. The mineral resources consist chiefly of coal, in the Coteau du Missouri, and great lignite deposits. The co. seat is Bismarck (18,640); other cities: Fargo (38,255); Grand Forks (26,836); and Minot (22,030). The state sends to Congress 2 senators and 2 representatives. It has a Senate of 49 members elected for 4 years, and a House of Representatives of 113 members elected for 2 years. There is a state univ. and a state agric. college. Area 70,665 sq. m., of which 611 sq. m. are water. It was first settled c. 1812-15. The state formed part of the Louisiana Purchase and remained for a long time unorganised. The part E. of the Missouri R. was attached to the ter. of Minnesota; the part on the W. to the ter. of Nebraska. Dakota was organised as a ter., 1861. N. D. was admitted as a state in 1889. Pop. (1950) 619,636. See C. Lounsberry, *Early History of North Dakota*, 1913; Z. I. Trinka, *North Dakota To-day*, 1919; L. F. Crawford, *History of North Dakota*, 1931, and *North Dakota*, 1938; Federal Writers' Project, *North Dakota: a Guide to the Northern State* 1938; B. Nelson, *Land of the Dakotas*, 1946.

**North Downs**, see Downs.

**North-East Passage**, route, finally found by A. E. Nordenskiöld (q.v.) in 1878-9,

from Europe and the Atlantic through the Arctic Ocean round the N. coast of Asia to the Pacific Ocean. *See also* ARCTIC EXPLORATION and NORTHERN SEA ROUTE.

**North-East Polder**, area of the Netherlands, consisting of part of the former Zuider Zee, now called IJsselmeer (q.v.). It is situated NW. of the prov. of Overijssel, and includes the two former ls. of Urk and Schokland. Its reclamation, completed in 1942, has provided an additional 120,000 ac. of agric. land. A number of vils. and modern roads have been built, and the new tn of Emmeloord is the social and commercial centre of the Polder (q.v.). Pop. 18,600.

**North-East Provinces, China**, *see* MANCHURIA.

**North Foreland**, *see* FORELAND, NORTH AND SOUTH.

**North Foreland, Battles off the**, were 3 battles of the Dutch wars. The first battle commenced on 2 June 1653, between fleets commanded by van Tromp and De Ruyter on the Dutch side, and Monck, Deane, Penn, and Lawson on the Eng. During the first day's fighting Deane was killed, but Blake came to the reinforcement of the English at night with 18 fresh ships, and on the next day the Dutch were obliged to retire. They had 11 ships captured and 7 or 8 sunk in the action. The second battle was one of the hardest fought and most disastrous battles of the second Dutch war. The Eng. fleet, under the command of Monck, engaged the Dutch fleet, commanded by De Ruyter, in the Downs, on 1 June 1666. The fighting went against the English, who eventually had to retire with a loss of 21 vessels against the Dutch loss of 7 ships only, although the victors were not in much better plight than the vanquished. An Eng. victory was gained in the third engagement, of 25 and 26 July 1666.

**North German Confederation**, league of Ger. states estab. in 1867, linking under Prussian leadership the 22 states N. of the R. Main. The King of Prussia was president and commander-in-chief of the army of the confederation. *See also* under GERMANY, History.

**North German Lloyd**, *see* NORDDEUTSCHER LLOYD.

**North Holland**, prov. of the Netherlands, comprising the peninsula between the IJsselmeer (Zuider Zee) and the N. Sea, including the is. of Texel on the N. side, and bounded on the S. by the prov. of S. Holland and Utrecht. Area 1150 sq. m. The inhab. are chiefly engaged in cattle-raising, agriculture, and gardening. There is considerable trade in dairy produce, and linen is manuf. in the tns. The fishing industry on the E. coast declined after the completion of the Afsluitdijk (q.v.) in 1932. Much of the land is below sea level and protected by dykes, and there are sev. canals, notably the N. Holland Canal and the N. Sea Canal. The chief tns are Haarlem (cap.), Amsterdam, and Hilversum. Alkmaar and Edam are famous cheese market centres. Pop. (1954) 1,950,244.

**North Island**, *see* NEW ZEALAND.

**North Kazakhstan**, oblast (prov.) of the

Kazakh S.S.R., lying on the N. border. The Ishim R. traverses the region, of which Petropavlovsk is the chief tn. It is in the black earth steppe region and produces grain, especially wheat, and beet. There are iron-ore deposits between the Ishim and upper Irtysh R.s. Pop. 360,000.

**North Lancashire Regiment**, *see* LOYAL REGIMENT.

**North Land**, *see* SEVERNAYA ZEMLYA.

**North London Collegiate School**, for girls, estab. in 1850 by Miss Frances Mary Buss (q.v.) in Camden Town, London, was among the first to recognise the importance of an intellectual education for girls. In 1940 the school moved to new buildings at Canons, Edgware.

**North Ossetian Autonomous Republic** lies on the N. slopes of the central part of the main Caucasus range and the adjacent lowland, traversed by the R. Terek. There are lead, zinc, and oil deposits. Maize and wheat growing, horticulture, sheep and cattle raising are carried on, and the industries include non-ferrous metallurgy, oil extraction, and food (including cheese). The cap. is Ordzhonikidze (q.v.). The area was included in the Mt People's Autonomous Rep. (q.v.) in 1920, was formed the N. O. A. Oblast in 1924, and the Rep. in 1936. It was largely occupied by Germans in 1942, and the scene of bitter fighting. Area 3500 sq. m.; pop. (1956) 417,000, mostly Ossetians (q.v.) and Russians. *See* W. Kolarz, *Russia and Her Colonies*, 1952.

**North Park**, one of the 'parks of Colorado', U.S.A., in Larimer co.; its area is 2000 sq. m., and it stands at a mean elevation of from 8000 to 9000 ft. It is noted for its big game.

**North Plainfield**, residential bor. of New Jersey, U.S.A., in Somerset co., 12 m. SW. of Jersey City. It manufs. metal products, electrical motors, and office equipment. Pop. 12,766.

**North Pole**, *see* ARCTIC EXPLORATION.

**North Rhine-Westphalia** (Ger. *Nordrhein-Westfalen*), Land of W. Germany, in the Federal Rep., bounded on the N. by Lower Saxony, on the E. by Hessen, on the S. by Rhineland-Palatinate, and on the W. by Belgium and the Netherlands. It comprises the former Prussian prov. of Westphalia, the governmental dists. of Cologne, Aachen, and Düsseldorf (once parts of the Rhine Prov., q.v.), and Lippe (qq.v.). In 1949 36 sq. m. of its ter. were given to Belgium and the Netherlands in frontier adjustments. It is divided into 6 areas, 38 urb., and 57 rural dists. There are 3 univs. (Cologne, Bonn, and Münster, qq.v.), and there are also a technical univ. at Aachen and a medical school at Düsseldorf. The pop. is (1954) 52.8 per cent Rom. Catholic and 42.2 per cent Protestant. The Land contains the Federal cap. Bonn. Area 13,107 sq. m. Cap. Düsseldorf. Pop. (1955) 14,693,200.

**North Riding**, *see* YORKSHIRE.

**North Sea**, or German Ocean, European sea, bounded on the E. by the continent of Europe, on the W. by Great Britain; on the S. it is connected by the Straits of

Dover with the Eng. Channel and the Atlantic; and on the N. it extends to the Shetland Isles, joining the Norwegian Sea in the NE. The maximum length is 600 m., the greatest breadth 400 m., and the total area 182,000 sq. m. The N. S. is very shallow, the Continent and Britain once being continuous. Its mean depth is about 50 fathoms. The Dogger Bank stretches across the N. S. from E. to W. The coasts of the N. S. are mainly flat; the Eng. coast consists of sandy cliffs and beaches, and the continental coast consists of marshes and protecting banks. The N. S. waters are composed of a mixture of Baltic water through the Skagerrak, Atlantic water through the Shetland-Faeroe channel, and Arctic water through the Norwegian Sea, and consequently there is a great variety of temp. and salinity in various parts of the sea. The union of the N. tidal wave and that from the straits of Dover sends high tides to London, a fact which is invaluable for shipping purposes. The Atlantic tides, which have a salinity of 35 *pro mille*, send out considerable heat. The fisheries of the N. S. are the most productive in the world. A Convention regulating the polling of the fisheries was concluded in 1882 by the European countries interested. Trawl fishing is extensively carried on in the shallow parts of the sea, and yields vast supplies of haddock, cod, whiting, halibut, sole, brill, turbot, plaice, etc. Line fishing is practised in the deep waters. The courses of the herring shoals round Britain are remarkable. In Shetland herring fishing commences in June, and later at various stages southward down the Brit. coast, till it ends in the late autumn and winter off Norfolk.

**North Sea-Baltic Canal, see KIEL CANAL.**  
**North Sea Canal** (Dutch Noordzeekanaal), Netherlands, completed in 1876, links Amsterdam with the N. Sea. It is one of the largest artificial inland waterways in the world, being 15 m. long, 100 yds. wide, and 40 ft deep, lying at 33 ft above sea level. New big locks at IJmuiden, the N. end of the canal, were inaugurated in 1930; partly destroyed during the Second World War, they were rebuilt in 1946.

**North Shields, see SHIELDS, NORTH.**

**North Somerset, see SOMERSET.**

**North Staffordshire, University College** of, founded in 1949 at Stoke-on-Trent. The chief force behind its inception was the activity of the city council of Stoke-on-Trent, the bor. council of Burton-on-Trent, and the co. council of Staffs, a corporate work paralleled only by the estab. of the 'Town's College' by the Edinburgh town council in 1563. The U. C. of N. S. was empowered to organise from the outset its own examinations for a B.A. degree, although the univs. of Oxford, Manchester, and Birmingham sponsored the college and appointed representatives to an academic council responsible for the maintenance of academic standards. The normal degree course comprises a foundation year of general studies and 3 further years of more specialised studies at honours level. As

a whole it is designed to avoid the danger of over-specialisation and yet combine breadth with depth. Keele Hall, some 5 m. from Stoke-on-Trent, was acquired as a central site; the capital expenditure for building was made the responsibility of the Univ. Grants Committee.

**North Staffordshire Regiment, The (The Prince of Wales's).** Formerly the 64th and 98th Regiments. The 64th, raised in 1756 as the 2nd Batt. 11th Foot, was made a separate regiment in 1758, and served in America, the W. Indies, and India. The 98th, raised in 1824, served in the Cape of Good Hope, China, and India. The 2 regiments were linked in 1881 to form the present regiment, which served in the S. African war, 1900-2. During the First World War it raised 17 battalions, which served in France, Flanders, Gallipoli, Egypt, Mesopotamia, Persia, and on NW. Frontier of India. In the Second World War the regiment fought in Libya and Italy. Amalgamation with the S. Staffordshire Regiment takes place in 1959.

**North Sydney:** 1. Residential suburb of Sydney, New S. Wales, Australia. It is situated on the N. shore of Port Jackson, and on account of overcrowding and transport difficulties in Sydney, some big commercial undertakings have transferred their offices to N. S. Pop. 55,970.

2. Nova Scotia, see SYDNEY.

**North Tarrytown, vil. of Westchester co., New York, U.S.A.,** 26 m. N. of the city of New York, on the Hudson R. Near here is Sleepy Hollow of Washington Irving's *Legend of Sleepy Hollow*, and it is also the burial place of Irving. It possesses an old Dutch Reformed church, dating from 1699. It manufs. electrical products and automobiles. Pop. 8800.

**North Tonawanda, city in Niagara co., New York, U.S.A.,** on the Niagara R., 10 m. N. of Buffalo. Its greatest amount of trade is carried on in lumber, but it also manufs. iron, nuts and bolts, boilers and engines, radios, toys, stone, metal, and paper products, and chemicals, drawing its electric power from Niagara Falls. Pop. 24,731.

**North-West Frontier of the Indian sub-continent,** one of the great frontiers of the Commonwealth, nearly 2000 m. in length, extending from the Karakoram Mts in the N. of Kashmir to the Arabian Sea. In the far N. it is bordered by Sinkiang; thence, for a short stretch, it borders Russian Turkestan along the Pamirs, then turns S. and for the rest of its length lies through the mt hinterland of the Afghan border tribes. From Chitral to Baluchistan, the boundary is the 'Durand line,' agreed with the Afghan Gov. in 1894. Throughout its length the frontier traverses Muslim ter., the greater part of which is occupied by warlike tribesmen. Sinkiang, too, is predominantly Muslim. On the Kashmir side, in this region, are the small Muslim states of Hunza and Gilgit now administered by the Pakistan Gov. Before the independence of India the Brit. Gov. of India was responsible for defending the N.-W. F., and most of the Brit. Indian Army was

concentrated on the frontier or in cantonments in the Punjab near by. Military action was not infrequent, but was with recalcitrant tribes, not an external enemy. Though in 1949 the Pakistan Gov. had fewer forces at its disposal, the position, in one respect, was more favourable for Pakistan than it was for the Brit. authorities, because as a great Muslim power it was likely to continue to attract a degree of loyalty from the tribesmen never given to Britain. Pakistan therefore withdrew most of its regular forces from the frontier, relying on the Frontier Irregular Corps and a few aeroplanes to keep the peace. Considerable progress has been made in development and pacification, but an uncertain factor is the attitude of the Afghan Gov. towards the Durand line settlement, which it had always regarded as one which deprived it of the allegiance of the tribes on the Indian (now Pakistan) side of the line. In 1947, after the decision to partition India, an effort was made to satisfy Afghan sentiment by holding a plebiscite in the N.-W. F. Prov. on the issue whether the Afghans there wished to join India or Pakistan. The plebiscite result was in Pakistan's favour, a result which was resented by the Afghan Gov., which had intimated to Britain that it did not regard the prov. as a part of Brit. India. Despite propaganda from Kabul that Afghanistan was no longer interested in the idea of the independence of the N.-W. F., it was obvious that official circles in Kabul still entertained hopes of Afghanistan *irredenta*, and there has been a prolonged propaganda campaign in favour of a visionary Pushtoonistan, proposed as an independent ter., including the tribes on both sides of the frontier. It has made little headway (see also *KHYBER PASS*). See Sir W. R. Barton, 'The North-West Frontier,' in the *Fortnightly*, Aug. 1949.

North-West Frontier Provinces, see PAKISTAN.

North-West Highway System, the Canadian section (1257 m.) of the Alaska Highway. See ALASKA, *The Alaska Highway*.

North West Mounted Police, famous force of paid and uniformed military police organised by the Canadian Gov. in 1873 under civil law and popularly known as the 'Mounties.' Though the Red R. Rebellion had ended in 1871, there was no security in the thinly pop. W. for life or property after Gen. Wolsley's soldiers had been withdrawn. The problem was met first by sending a garrison to replace Wolsley's soldiers and then by raising the N. W. M. P. In the summer of 1874 their scarlet coats (scarlet was chosen for the tunic because it was admired by the Indians on the Canadian side of the border) appeared on the prairies for the first time, when a detachment of 300 men marched from Dufferin, now the border tn. of Emerson, to posts on the plains. This land march, ending where Fort McLeod was built, is one of the most memorable episodes in the hist. of the N. W. M. P. The mounted police were never a large force and always depended

on their reputation for integrity, fairness, and courage rather than on numbers. They soon dealt with law-breakers, whisky runners vanished, and Fort McLeod became a centre for the maintenance of law and order on the border lands of the W. The police also had an important part in the difficult problem of the half-starving Indians of the prairies, and much of the work of persuading them to go on the Reserves was entrusted to the mounted police. Their forts had been centres for the distribution of food, and from those centres the tribes were shepherded northward to the wooded country where lands had been set apart for them, and the 'Mounties' were always regarded by the Indians as friends. In 1904 the force was granted the privilege of calling itself the Royal N. W. M. P., and in 1920, when it was given duties in various parts of the dominion, the name was changed to the Royal Canadian Mounted Police (q.v.).

North-West Passage, see ARCTIC EXPLORATION.

North-West Territories, see NORTH-WEST.

Northallerton, mrkt tn and cap. of N. Riding of Yorks, England, 40 m. N. of Leeds. It is the site of an old Rom. camp, and All Saints' church dates from the 12th cent. Remains of a Carthusian priory are near by. Leather goods and engineering products are made. Pop. 7000.

Northam: 1. Urb. dist. and seaside resort in N. Devon, England, incorporating Westward Ho! (q.v.) and Appledore. The par. church dates from 1261; the Stella Maris convent school is at N. Shipbuilding flourishes at Appledore. Pop. 6500.

2. Tn in York co., W. Australia, in the Avon valley, 66 m. N.E. of Perth. It is a junction for the S. line to Albany, and centre of a farming dist. Pop. 5725.

Northampton, Spencer Joshua Alwyne Compton, 2nd Marquess of (1790-1851), politician, b. Wilts, England. He was associated with Wilberforce in the anti-slavery campaign, and helped Sir James Mackintosh in his efforts to reform the criminal law. From 1838 to 1849 he was president of the Royal Society.

Northampton, William Parr, Marquess of (1513-71), brother of Catherine Parr (q.v.), the sixth wife of Henry VIII. He was created Earl of Essex in 1543 and Marquess of N. in 1547. He played an important part during the reign of Edward VI, supporting the causes first of Somerset and then of Northumberland. On the death of Edward VI he supported the accession of Lady Jane Grey (q.v.) and as a result was condemned to death under Mary, but the sentence was commuted to the forfeiture of his titles and estates. On the accession of Elizabeth I he was again taken into favour and was created marquess for the second time in 1559.

Northampton: 1. Co. and mrkt tn, parl., co. and municipal bor. of Northants, England, on rising ground on the l. b. of the R. Nene, 67 m. W. of London. N. was held by the Danes at the beginning of the 10th cent. and was burned by them

in 1010. After the Conquest it was bestowed on Simon de St Liz (Senlis), and the castle he built (now destroyed) became a favourite resort of the Norman and Angevin kings. Prin. buildings of modern N. include the shire and tn halls, the modern police building and fire station, and the numerous churches, among which are St Peter's, a restored and beautiful specimen of enriched late Norman work, and the 12th-cent. church of the Holy Sepulchre, one of the very few round churches in the country. N. is the seat of a Rom. Catholic bishop (the Catholic cathedral was designed by

Ermine Street both cross the co. In 1215 the barons besieged Northampton Castle, held by King John, and in 1264 the castle was wrested from the younger Simon de Montfort by Henry III. Henry VI was defeated at Northampton during the Wars of the Roses, and later the famous battle of Naseby (1645) took place in the co. N. has few monastic remains, the most important being the abbey church of Peterborough (Medeshamstede), now the cathedral, begun by Penda in 665; there are some beautiful Norman churches. Famous market crosses are at Brigstock, Helpston, Higham Ferrers,



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SULGRAVE MANOR, NORTHAMPTONSHIRE: SOUTH FRONT

Pugin). Boot- and shoe-making is the staple industry, and other industries include leather trimming, and the manuf. of leather goods, shoe machinery, ladies' clothing, electric lifts, fire grates, motor-car accessories, lasts and models; also motor-body building, engineering, printing, and brewing. N. returns 1 member to Parliament. Pop. 103,700.

2. City in Hants co., Massachusetts, U.S.A., on the r. b. of the Connecticut R., 8 m. NW. of Holyoke. It has manufs. of silk, brushes, cutlery, etc. There are the Smith College for women and the Clarke School for the deaf in the city. Pop. 29,003.

3. Tn of W. Australia, 262 m. NNW. of Perth, a lead-mining centre. Pop. 630.

Northamptonshire, midland co. of England, originally included in the Mercian kingdom, and part of Tostig's earldom in the 11th cent. At Harrington there is evidence of occupation in the early Iron Age. Earthworks and Rom. remains have been found, and Watling Street and

Irthlingborough, and at Hardingstone and Geddington are two of the Queen Eleanor crosses built by Edward I in memory of his wife. The ruins of Fotheringay Castle, where Mary Queen of Scots was executed, are also in the co. The family of George Washington, first president of the U.S.A., originated at Sulgrave Manor (q.v.). Notable N. mansions include Burghley House, Althorp Park, Rushton Hall, Rockingham Castle, Castle Ashby, Dingley Hall, Deene Park, and the ruined Kirby Hall.

The surface of the co. is mainly level or broken with low hills, and the scenery is beautiful and well wooded. It includes part of the fen country (q.v.), what is known as the 'soke' of Peterborough, being land reclaimed from the Fens (the soke constitutes a separate administrative co.). The prin. rvs. are the Avon, Nene, Welland, Cherwell, Leam, and Ouse. The Grand Union Canal crosses the co. Ironstone in large quantities, limestone, and



clay are worked, and a particular kind of building-stone known as Weldon or Stamford marble. The mild climate and level surface, in addition to a rich soil, are admirable for agriculture. Farming of all kinds flourishes, wheat and barley being the prin. crops, while cattle and sheep are reared extensively, the former especially in the rich pastures of the Nene and Welland valleys. Apart from agriculture the main industries are the iron-working carried on at Kettering, Wellingborough, etc., and the manuf. of boots and shoes, Northampton being the centre of the trade for England. Since 1933 iron ore has been quarried at Corby (q.v.) and iron and steel foundries estab. The co. is divided into 4 co. constituencies and 1 bor. constituency (the co. tn), each returning 1 member to Parliament. Areas, N. co. 905 sq. m.; Soke of Peterborough 84 sq. m.; pops. 265,200 and 65,000. See J. Taylor, *Bibliotheca Northamptoniensis*, 1869; Victoria Co. History, *Northamptonshire*, 1908; A. Mee, *Northamptonshire*, 1945; T. Ireson, *Northamptonshire*, 1954.

**Northamptonshire Regiment, The.** The 1st Batt. was originally the 48th (Northampton) Foot, and was raised in 1740; the 2nd Batt. was the 58th (Rutlandshire) regiment of foot, raised in 1755. The 2 regiments were linked in 1881. The 48th served first as marines and took part in the battle of Culloden (1746). The 58th had a fine record in the Peninsular War and also fought in the Crimean War, at Sevastopol, in S. Africa (1879), at Tirah (1897-8), and at the Modder R. in the S. African war. The 1st Batt. went out to the W. front as part of the 2nd Infantry Brigade, 1st Div. of the original B.E.F., in 1914, suffering very heavy losses in resisting the Ger. attack of 2 Nov. 1914, near Hooge Wood. The 4th Batt. (T.A.) took part in the Suvla landing in 1915 and later (1916) in the second battle of Gaza. Service or 'Kitchener' battalions of the regiment fought in the Somme battles of 1916, and were conspicuous in 1917 for their part in the defence of the Lombardy light-house. In the last year of the war they fought at Villers-Bretonneux, Bapaume, Epéhy, and in the Cambrai-St Quentin battle. In the Second World War they fought in many of the most critical battles of the Burma campaign. In Italy other units were part of the Eighth Army (q.v.). The Northamptonshire and Royal Lincoln Regiments are to be joined to form the 2nd East Anglian Regiment. See R. Gurney, *History of the Northamptonshire Regiment, 1724-1934*, 1935. See also REGIMENT.

**Northbrook, Barony of**, see BARING.

**Northcliffe of St Peter in Thanet, Alfred Charles William Harmsworth, 1st Viscount (1865-1922)**, newspaper proprietor, b. Chapelizod, Dublin, eldest child of Alfred Harmsworth, a barrister of Eng. birth. He started in journalism as a reporter for the *Hampstead and Highgate Express*, and later he became assistant editor of *Youth*, a paper linked with the *Illustrated London News*. After an attack of pneumonia in 1884, he had to live out of London, and worked for Iliffe & Sons, Coventry.

With modest savings, he returned in 1887 to London, opening as a publisher at 26 Paternoster Square. On 2 June 1888 he pub. the first number of a snippet weekly, first called *Answers to Correspondents*, but soon merely *Answers*, modelled on the pattern of Newnes's *Tit-Bits*, begun 1881. He was assisted in this enterprise by his brother Harold Sidney, afterwards the first Lord Rothermere. In 1892 they were selling 1,000,000 copies weekly. In Aug. 1894 N. bought the *Evening News*, a Conservative paper. The same year he equipped the Jackson arctic expedition at his own expense. On 4 May 1896 he began pub. of the *Daily Mail*, a revolution in journalism from its inception, with ideas of make-up and presentation of news items which were widely copied by rivals. The Harmsworths also acquired newspapers at Glasgow and Leeds. Innumerable, as years went by, were the subsidiary Harmsworth journ. pub. by Amalgamated Press. In 1904 he was made a baronet, and in 1905 he became Baron N. In 1906 he and his brother acquired forests in Newfoundland, in order to make their own paper. In 1908, with the utmost precaution to ensure secrecy of the negotiations, he became proprietor of *The Times* (see H. Kitchin, *Moberley Bell and 'The Times'*); he retained the controlling interest until his death. Through the *Daily Mail* he had been popularly supposed to have made the S. African war; and in the First World War he performed notable service as head of the British War Mission in the U.S.A., but he declined the Ministry of Air when Lloyd George offered it to him in Nov. 1917. He was made a viscount that year, and became director of propaganda in enemy countries, in which work he was extremely successful. From the end of 1918 he suffered much in health, largely owing to overwork throughout his life. He went for a tour round the world in 1921, but received no benefit. He d. in London, 1922. He was married, but left no issue.

That N. was a great journalist is not open to doubt. His aim was not so much to 'amuse' as to humanise and extend the scope of the daily newspaper. He was the first to see that women, as well as men, could be interested in a newspaper. A notable quality of N. was his prescience. He foresaw the possibilities of aviation more clearly than most, except the experimental pioneers themselves and the military advisers. His part in the First World War in moulding and interpreting public opinion was of great importance. But in Fleet Street his name will probably be mainly associated with raising the status of the ordinary journalist. It was well said that nothing unclean or indecent was allowed in any of the journ. under his control. Through his numerous pubs. N. exercised tremendous influence and was one of the most dynamic personalities of his generation in Great Britain. See Sir M. Pemberton, *Lord Northcliffe, a Memoir*, 1922; M. Wilson, *Lord Northcliffe*, 1927; H. Hamilton Frye, *Northcliffe: an Intimate Biography*, 1930; T. Clarke, *My Northcliffe Diary*, 1931;

Sir J. A. Hammerton, *With Northcliffe in Fleet Street*, 1932; and H. J. Greenwall, *Northcliffe: Napoleon of Fleet Street*, 1957.

**Northcote, Henry Stafford**, 1st Baron Northcote of Exeter (1846-1911), statesman, b. London, was the second son of Sir Stafford Henry N., first Earl of Iddesleigh, and was educ. at Eton and Merton College, Oxford. In 1877 he became private secretary to his father, then chancellor of the exchequer, and in 1880 became a member of Parliament. He held minor appointments until 1900, when he was raised to the peerage and made governor of Bombay, in which position he greatly distinguished himself. The Commonwealth of Australia was formed in 1901, and 3 years later N. went out as governor-general (1904-8).

**Northcote, James** (1746-1831), painter, b. Plymouth. In 1773 he began his studies under Sir Joshua Reynolds (of whom he wrote a life, pub. 1813) and at the Royal Academy schools. He went to Italy in 1777, and on his return to England he became famous as a portrait painter. In 1786 he was elected associate of the Academy, and his historical picture, 'The Young Princes murdered in the Tower,' was completed in that year. This was followed by 'The Burial of the Princes' and 'The Death of Wat Tyler.' 'The Entombment' and 'The Agony in the Garden' are among his last works. Much information about N. as an individual is contained in articles pub. in 1826 by Wm Hazlitt in the *New Monthly Magazine*; these appeared in book form in 1830 as *Conversations with James Northcote Esq., R.A.* (new ed. by F. Swinnerton, 1949).

**Northcote, Sir Stafford**, see IDDESLEIGH. **Norther**, cold or N. or NW. wind, often with snow, occurring in winter in the Gulf of Mexico and Texas regions. The N.s are produced by a strong depression over the W. Caribbean Sea.

**Northern Circars**, *see* CIRCARS.

**Northern Council**, *see* NORDIC COUNCIL.

**Northern Dialect**, *see* ENGLISH LANGUAGE.

**Northern Diver**, *Great*, *see* LOON.

**Northern Ireland**, *see* IRELAND, NORTHERN, and ULSTER.

**Northern Lights**, *see* LIGHTS, NORTHERN.

**Northern Nigeria**, *see* NIGERIA.

**Northern Pacific Railway**, with 6879 m. of track, operates mainly in the states of Minnesota, N. Dakota, Montana, Idaho, Washington, and Oregon, with Pacific coast terminals at Seattle and Portland, and middle W. terminals at Minneapolis, St. Paul, and Duluth. The road was constructed under an Act of the U.S. Congress in 1865, and was completed in 1883. It handles a large freight business, especially cargoes of grain, timber, and mineral ore.

**Northern Rhodesia**, *see* RHODESIA AND NYASALAND, FEDERATION OF, and RHODESIA, NORTHERN.

**Northern Sea Route**, system of shipping lanes traversing the coastal waters N. of Siberia from the Bering Strait in the E. to the straits between the Barents Sea and

the Kara Sea in the W. It has been mainly developed by the chief administration of the N. Sea Route (Glavsevmorput'), beginning with the appointment by the Soviet gov. of O. Y. Schmidt (q.v.), 1932-9. The administration was given responsibility in the 1930's for the whole economic development of N. Siberia. The route is important both politically and from an economic viewpoint. *See* T. E. Armstrong, *The Northern Sea Route*, 1952.

**Northern Territory**, name given to that part of the Australian continent N. of 26° S. lat., and between 129° and 138° E. long., with a length of about 1000 m. and breadth of 580 m. Total area is 426,320 sq. m., and over four-fifths lies within the Torrid zone. The chief is. off the coast are Melville, Bathurst, Croker, Groote Eylandt, and Wessel.

**Physiography**. The low, flat coastline of 1040 m. seldom reaches a height of 100 ft. Sandy beaches and mud flats, thickly fringed with mangroves, prevail. The coastline is indented with bays and inlets and the estuaries of numerous rivers, of which the Roper R. is the chief. Many of the rivers are navigable by shallow-draught vessels for considerable distances, but apart from Port Darwin there is an almost complete lack of navigable harbours. Inland there is a general rise southwards to the 18th parallel, where the higher lands form the watershed between the rivers flowing northwards to the sea, and those forming the scanty supply of the interior systems. Towards the centre of the continent the land over a wide area is of considerable elevation and there are sev. mt ranges, generally with an E. and W. trend. The prin. is the Macdonnell Range (q.v.), which reaches 4000 ft.

**Climate**. The climate varies considerably over the whole ter., the proximity of the sea keeping the coastal regions more equable, while further S. the climate is of a continental type. Over four-fifths of the ter. lies within the tropics. In the N. section the year has 2 climatic divs.—the wet season, lasting from Oct. to April, and the dry, May to Oct. Darwin averages 56 in. in the wet season and 3 in. in the dry. The S. part of the ter. is generally sandy, and below the 16th parallel ann. rainfall is less than 25 in. and evaporation high. Alice Springs averages about 10½ in. per year. Sub-artesian water from bores is used in these areas.

**Fauna and flora**. The ordinary types of native Australian fauna inhabit the ter. Marsupials, crocodiles, fresh-water tortoises, snakes (mostly non-venomous), and frogs abound. The bird life is prolific and includes honey-eaters, butcher birds, Torres Strait pigeons, scrub turkeys, cockatoos, and many varieties of parakeets, as well as water birds in the coastal areas. There are many varieties of fresh-water fish. The white ant is a pest, and mosquitoes and sand flies are troublesome, particularly in the wet season. Buffalo formerly existed in large herds. The N. T. is poorly endowed with forested land, the greater part carrying either no timber or only scattered trees of a stunted

type. This is owing to climate and the low rainfall received over much of the interior. Forests occur only in the N. portion of the ter. and are mostly located within a 300-m. radius of Darwin. They are of 4 types—open eucalypt; cypress pine; dense pure forest of paperbark on swamplands and along streams; and small areas of rain forest. In the first 3 scarlet banksia and yellow bottle brush are found. In the low rainfall areas there is mulga, some desert oak, and riv. red gum along the water courses. In the Victoria R. and Barkly Tableland dists. there are large areas of open downs country with Mitchell and Flinders grass. Much of the centre area is arid spinifex country and sandy desert, but there are areas of sparse shrubs and grasses which make good cattle country.

**Production.** Much of the interior is desert, but peanuts, tobacco, cotton, grain, sorghum, bananas, pineapples, citrus, mangoes, pawpaws, vegetables, fodder plants, and rice can be grown in certain areas. Transport difficulties and the great distance from markets have hitherto prevented economic development, but peanuts have been exported for some years. On the subcoastal plains E. of the Stuart Highway, and extending to and beyond the Adelaide R., experiments in rice-growing have been carried out in recent years. At Humpty Doo, 30 m. from Darwin, rice has already been produced in small quantities. The pastoral industry has long been the mainstay of the ter.'s economy, the main element of pastoral production being beef cattle. Main beef cattle areas are the Alice Springs, the Barkly Tablelands, and the Victoria R. Dists. Beef cattle pop. at 31 Mar. 1956 was over 1,000,000. Value of cattle exported during 1954-5 was £1,871,653. Since 1951 there have been promising experiments in transporting beef carcasses by air to Wyndham for overseas export. The sheep industry, by contrast, is of minor importance and is confined to the Alice Springs Dist. Estimated number of sheep at 31 Mar. 1956 was 33,000. Horses are no longer bred for export, but stock horses are bred. There is little pig-raising and practically no dairying at present.

The N. T. is rich in mineral resources and mining is the second most important industry. Tennant Creek is the main gold-producing area. Other minerals worked in the ter. include copper, mica, tin, and wolfram. Uranium was first discovered at Rum Jungle in Sept. 1948 and many other deposits have been found subsequently. The first full-scale treatment plant was opened at Rum Jungle on 17 Sept. 1954. Total value of mineral production (excluding uranium) in 1954-5 was £1,753,168. The prin. exports from the ter. are cattle, minerals, and pearl shell.

**Transport and communication.** There is a railway from Port Augusta to Alice Springs, a distance of 771 m., of which 200 are in the N. T. The terminus of the N. Australian Railway is at Birdum, 316 m. from Darwin. For road transport

2 new highways were built during the Second World War: the Stuart Highway, from Darwin to Alice Springs (954 m.), and the Barkly Highway, from Tennant Creek to Mt Isa, Queensland (400 m.). At 30 June 1955 there were 111 licensed aerodromes in the ter., of which 70 are included in scheduled airline services. Darwin has a first-class international airport. In addition to internal airways the main routes regularly operated are Darwin-Brisbane and Sydney; Darwin-Adelaide via Alice Springs; Darwin-Perth via Wyndham. The N. T. has a comprehensive aerial medical service based on Darwin with an additional service operating from Alice Springs. Specially equipped Australian made de Havilland Drovers are used. Use of shipping is restricted by the fact that Darwin is the only port in the ter. capable of accommodating large vessels, but regular services are run from Perth as well as the E. states.

**Population.** The N.T. is sparsely populated. In 1947 the pop. was 10,868, and in 1954 16,469, excluding full-blood aborigines. The pop. of Darwin was then 8071, and Alice Springs 3000. The aboriginal pop. was estimated at 13,962.

**Aborigines.** The long-range policy of the Commonwealth Gov. is to encourage the assimilation of the aborigines as an integral part of the community. The aboriginal pop. is estimated to have remained fairly constant over the past few years, and a recent estimate puts the total at less than 14,000 full-bloods. Of these over 3000 are in full employment, over 4000 are under the influence of missions, and over 3000 reside on gov. settlements; only about 600 remain truly nomadic.

The administration has set aside 17 areas as reserves, the largest of which is Arnhem Land. Throughout the reserves there are 13 gov. settlements. Special schools to cater for the aborigines, particular needs have been estab.—10 conducted by the gov., 13 by missions, and some by pastoral companies. Seven mission authorities function in the ter., keeping in regular contact with over 4000 full-blood aborigines. There are 14 mission stations in the ter.

**History and administration.** The region formerly belonged to New S. Wales, but was annexed to S. Australia in 1863 and transferred to the Commonwealth on 1 Jan. 1911. In 1926 the ter. was divided, for administrative purposes, into N. Australia and Central Australia, the dividing line between these 2 ters. being 20° S. lat. The whole of the N. T. was reconstituted as an administrative entity in 1931. In 1947 the Northern Territory (Administration) Act estab. a legislative council consisting of the administrator and 6 elected and 7 official representatives. The council has power to make ordinances for the N.T. which are subject to the assent of the Administrator and in certain circumstances of the Governor-General. The N.T. elects a member to the House of Representatives who has the right to take part in debates but to vote only on

matters relating to N. T. ordinances. The seat of the Administration is Darwin.

The coast was surveyed by Philip Parker King in 1818 and by J. C. Wickham and John Lort Stokes in 1838 and 1839. Port Darwin was charted in the latter year. In 1845 Leichhardt reached Port Essington after a trying journey from S. Queensland during which he and his party were attacked by aborigines, and his naturalist, John Gilbert, was killed. His route is marked by the names which he gave to features that he discovered, amongst these being Calvert and Roper R.s., named after members of the party. Two years later Leichhardt embarked on his fateful journey from E. to W. whence none of his party returned. In 1855-6 A. C. Gregory explored the interior, crossing from W. to E. down the Victoria R., Stuart Creek, the Elsey, and then into Queensland. In 1861 J. McDouall Stuart began his transcontinental journey from Adelaide and reached the W. side of Van Diemen's Gulf in 1862. Early settlements at Port Essington, Fort Dumas, and Raffles Bay all came to nothing, but Darwin's future was assured when Charles Todd, superintendent of telegraphs for S. Australia, selected it as the terminal for the submarine cable from Java. The overland telegraph from Adelaide to Port Darwin was completed under Todd's direction by 22 Aug. 1872.

In the eighties some thousands of Chinese and other aliens were employed on the railway construction works for the Palmerston (now Darwin)-Pine Creek Railway. In the meantime legislation in Queensland, designed to restrict the employment of alien labour in that state, had a direct bearing on N. T. hist., for the S. Australian gov., yielding to general popular sentiment, abandoned the project of developing the ter. by any but white people. This restrictive policy foreshadowed the White Australia ideal.

Arnhem Land has in recent years been explored by D. F. Thomson. He found that the native inhab. had been strongly influenced by Malay or Macassar visitors. Indonesian characteristics are preserved in vocabulary, ceremonial life, and material goods, such as the dug-out canoe, smoking pipe, and calico. In 1948 the Amer.-Australian Scientific Expedition to Arnhem Land made important findings in the fields of aboriginal art and mythology, archaeology, ethnology, botany, and zoology.

See M. Terry, *Across Unknown Australia*, 1925, and *Through a Land of Promise*, 1927; H. Basedow, *The Australian Aboriginal*, 1925; A. G. Price, *The History and Problems of the Northern Territory, Australia*, 1930; C. P. Conlgrave, *North Australia*, 1936; C. T. Madigan, *Central Australia*, 1936 (new ed., 1944); C. Chewing, *Back in the Stone Age: the Natives of Central Australia*, 1936; W. L. Warner, *A Black Civilization: a Social Study of an Australian Tribe*, 1937; C. P. Mountford, *Brown Men and Red Sand: Wanderings in Wild Australia*, 1948; D. F. Thomson, 'Arnhem Land: Explorations among an Unknown People,'

*Geographical Journal*, 1948-9, and *Economic Structure and the Ceremonial Cycle in Arnhem Land*, 1949; H. E. Thonemann, *Tell the White Man: the Life Story of the Aboriginal Lubra*, 1949; C. L. A. Abbott, *Australia's Frontier Province*, 1950; E. Hill, *The Territory*, 1951; C. Simpson, *Adam in Ochre: Inside Aboriginal Australia*, 1951; H. R. Finlayson, *The Red Centre: Man and Beast in the Heart of Australia* (2nd ed.), 1952; Australian Institute of Political Science, *Northern Australia: Task for a Nation*, 1954; A. C. Moorehead, *Rum Jungle*, 1954; J. E. Bray, *Northern Territory in Brief*, 1956 (pamphlet); Records of the Amer.-Australian Scientific Expedition to Arnhem Land, vol. i, *Art, Myth, and Symbolism* (C. P. Mountford), 1956.

**Northern Union**, Eng. rugby football union formed in 1893, to avoid the ban on professionalism within the Rugby Union, and renamed the Rugby League in 1922. See FOOTBALL, *Rugby League*.

**Northfield**: 1. Dist. of the city of Birmingham (q.v.), England; the church, mentioned in Domesday Book, has a Norman tower and door. The Great Stone Inn, the vil. pound, and sev. old cottages still preserve the character of the vil. as it was before the city encompassed it.

2. Tn of Washington co., Vermont, U.S.A., 10 m. SW. of Montpelier. Here is Norwich Univ., removed in 1866 from Norwich. Pop. 4314.

3. City in Minnesota, U.S.A., 35 m. S. of St Paul, in grain, livestock, and dairying area. It is the seat of Carleton College and St Olaf College. Pop. 7500.

4. Tn in Massachusetts, U.S.A., 42 m. NE. of Springfield. It is the bp. of Dwight L. Moody (q.v.), and the site of N. School for girls and Mt Hermon School for boys. It is also the H.Q. of American youth hostels. Pop. 2246.

**Northfleet**, tn of Kent, England, 1½ m. W. of Gravesend, engaged in the manuf. of paper, chemicals, cables, rubber tyres, and cement. Pop. 19,280.

**Northmen**, see NORMEN.

**Northolt**, par. in the bor. of Ealing (q.v.), Middx, England, 2½ m. SSW. of Harrow. The manor was given by William the Conqueror to Geoffrey de Mandeville, and granted in 1398 to the abbey of Westminster. During the Second World War the aerodrome here was the station of the Polish fighter wing and an important air transport terminal. Subsequently it was developed as one of the two main civil airports for London, but its use as such has been discontinued.

**Northrop**, John Howard (1891- ), Amer. biochemist and biologist, b. Yonkers, New York, and educ. at Columbia Univ. (B.S., 1912; Ph.D., 1915; D.Sc., 1937). Since 1916 he has worked at the Rockefeller Institute for Medical Research, Princeton, New Jersey. N. is the author of a book on crystalline enzymes, and shared the Nobel prize in 1946 for his work in this sphere. He pub. *Crystalline Enzymes* in 1939.

**Northstead, Manor of**. Appointment to the crown stewardship of this Yorks

manor serves as an occasion for the resignation of a member of Parliament. See *CHILTERN HUNDREDS*.

**Northumberland, Dukes and Earls of.** Since the time of the Norman Conquest there was an Earl of N., but the title did not become hereditary until 1377, when Henry, Baron Percy, became earl. The title of Duke of N. was held by John Dudley from 1551 until his death in 1553 (see separate article). The ducal title was held by George Fitzroy, a natural son of Charles II, from 1683 until his death without issue in 1716.

Except for a period of forfeiture, from the death in 1408 of the first earl until its restoration to his grandson, the title of earl remained in the Percy family (q.v.) until the death of the eleventh earl in 1670; his daughter married Charles Seymour, Duke of Somerset, and their son Algernon, seventh Duke of Somerset, became Earl of N. in 1749. Dying without issue, his son-in-law, Sir Hugh Smithson, became earl and took the name of Percy: in 1766 he was created Duke of N. The fourth duke d. in 1875, the title passing to his grand-nephew George, Earl of Beverley: from him are descended the later dukes of N. The present duke (b. 1914) succeeded his brother, who was killed in action in 1940. See G. Brennan, *History of the House of Percy* (ed. W. A. Lindsay), 1902.



JOHN DUDLEY, FIRST DUKE OF  
NORTHUMBERLAND

**Northumberland, John Dudley, Duke of** (c. 1502-53), politician and soldier. His father had been attainted, but this was reversed by Henry VIII. He had a successful military career and was already powerful when Henry VIII d. Further military success followed, and N. soon became the real power behind Edward VI (q.v.) and in 1551 was created Duke of N. Utterly unscrupulous in his lust for power and extremely capable, N. married one of his sons to Lady Jane Grey (q.v.), 1553, hoping thereby to retain his authority after Edward's death. He was primarily

responsible for the attempt to make Jane Queen of England, and after Mary's accession was executed for treason. Another of his sons became Elizabeth I's favourite, the Earl of Leicester.

**Northumberland**, most northerly co. of England. There are extensive Rom. remains in N., including Hadrian's Wall (q.v.). The co. originally formed part of the Saxon kingdom of Bernicia, which with Deira became merged into the kingdom of Northumbria (q.v.) about the end of the 6th cent. It suffered much from border raids, but there are some fine old buildings, notably Lindisfarne Priory (1093), Hexham Abbey Church, built over the crypt of Wilfrid's Abbey of St Andrew, and the castles of Alnwick, Dilton, etc. The co. also includes such famous battlefields as Otterburn and Flodden Field, and is the home of the great Percy family. The coastline is flat and sandy, the cliffs are low, and there are few inlets. There are sev. is., the most important being Holy Is., or Lindisfarne, and the Farne Is. The surface from the low plains in the E. rises to a moorland region in the centre, and so upward to the Cheviot Range, reaching its greatest elevation in the Cheviot (2876 ft.). The chief rivs. are the Tweed, Aln, Coquet, Wansbeck, Blyth, and Tyne; the Tweed being famous for its salmon fishing and the Coquet for its trout. In the SE. lies the big coal-field; lead and zinc are found, and building-stone is quarried. The soil varies very much, and a large proportion is permanent pasturage. Oats and barley are the prin. crops. Sheep-rearing is carried on very extensively, there being a particular breed known as the Cheviots; cattle are also reared. Tyneside forms the great manufacturing centre, the industries including shipbuilding, iron works, blast furnaces, rope works, chemicals, potteries, brick-fields, and glass factories. Machinery and tools are also manuf. N. Shields is the centre of the sea-fisheries, and Hexham is the largest marketing centre for store cattle in the country. The Tyne has the largest coal-shipping trade in the world, Newcastle being the prin. port. Other ports besides those on the Tyne are Blyth, Amble, Alnmouth, and Berwick. The co. is divided into 10 parl. divs., each returning 1 member. Area 2018 sq. m.; pop. 798,175. See *Victoria County History, Northumberland*; *Newcastle upon Tyne Public Library, Local Catalogue of Material concerning Newcastle and Northumberland, 1932*; Ann Sitwell, *Northumberland, 1949*.

**Northumberland Fusiliers, The Royal**, raised as a regiment in Dutch service in 1674; it finally became part of the Brit. Army in 1688. It fought at the battle of the Boyne, served in the Seven Years War and in the Amer. War of Independence, and fought in most of the great battles of the Peninsular war, winning the nickname of the 'Fighting Fifth.' In 1836 it became a fusilier regiment, and served in the Afghan war, 1878-80, at Khartoum, and at the Modder R. and other battles in the S. African war, 1899-1902. In the First World War the 1st

Batt. was part of Shaw's 9th Infantry Brigade in the original B.E.F. In that war the N. F. comprised, besides 3 regular and special reserve battalions, 5 territorial force battalions, and a score of service (new army) battalions. The 1st Batt. was prominent at the capture of Givenchy (Oct. 1914) and in the storming of Aubers. Various units fought in the Somme battles of 1916, and, together with sev. Canadian units, the N. F. suffered very severe losses in the La Boisselle-Contalmaison region. The 9th Batt. greatly distinguished itself in the fighting near Mametz wood. In 1918 units of the regiment took part in the dour fighting on the Menin Road-Polygon Wood front of the Ypres salient. In the Second World War the N. F. served on the W. front and in NW. Europe. They fought in the battle of Normandy, 1944, and in the advance to the Rhine, while other units were part of the Eighth Army (q.v.) and fought in the battles for Sicily, in those on the advance to Rome, and in the bitter struggle for the Gothic line. The 1st Batt. served with the 29th Brigade in the Korean war. See H. M. Walker, *History of the Northumberland Fusiliers*, 1919. See also REGIMENT.

**Northumberland Strait**, Canada, separates Prince Edward Is. from Nova Scotia and New Brunswick. Length 130 m., breadth 8 to 30 m.

**Northumbria**, one of the greatest of the A.-S. kingdoms, situated between the Humber and the Forth, originally consisted of 2 independent kingdoms, Bernicia and Deira. Of the former kingdom Ida was the first ruler (547-49). The first ruler of Deira was Ella (560-188), and he was succeeded by Ethelfrid, who had united the 2 kingdoms by 603. Redwald of E. Anglia defeated and slew Ethelfrid, and Edwin, son of Ella, then succeeded to the throne of N. He extended the frontiers to the coast (including Anglesey and Man), and during his reign the kingdom was the most powerful in England. After Oswald's death (641) the kingdom disintegrated, and did not recover its former position till Oswy became King of Bernicia, defeated and killed Penda of Mercia in 654, and incorporated the N. part of Mercia in his kingdom. Mercia recovered her ter. in 658, and N. pushed her frontiers northward, annexing Strathclyde and Dalriada. In 685 the Picts recovered their independence. Aldfrith, the son and successor of Oswy, made no further attempts to extend his kingdom. Under his patronage learning flourished. His successors were incompetent rulers, and henceforth the political decline of the kingdom was rapid. The first Dan. raids occurred c. 793. In 827 Eanred, King of N., formally acknowledged the supremacy of Egbert of Wessex. From 876 to 954 N. was largely controlled by the Danes, and subject to increasing Scandinavian immigration. After the battle of Stainmore (954) the permanent separation of N. from the rest of the Eng. kingdom ended. N. was for a considerable period the chief seat in England of literary and missionary activity. In the Golden Age of the Con-

version Cuthbert flourished in his monastery at Lindisfarne, Bede at Wearmouth and Jarrow, and Wilfrid at Hexham and Ripon. In 731 Bede at Jarrow wrote his famous *Ecclesiastical History*. The stone crosses, Ruthwell and Bewcastle as early examples, and the schools of York and Ripon as later developments, are evidence of the beauty and power of Northumbrian sculpture. It was not till the reign of William the Conqueror that N. really became an integral part of England. See R. H. Hodgkin, *History of the Anglo-Saxons*, 1939 ed., and T. D. Kendrick, *Anglo-Saxon Art*, 1938.

**Northumbrian Dialect**, see ENGLISH LANGUAGE.

**Northwest Territories**. The mainland portion of Canada, N. of lat. 60°, between Yukon Ter. on the W. and Hudson Bay on the E., together with the is. between the Canadian mainland and the N. Pole, including those in James Bay, Hudson Bay, and Hudson Strait, comprises the N. Ters.; the region includes the former N. Ter. and Rupert's Land except such areas of these as form the Yukon Ter. and the provs. of Alberta, Manitoba, and Saskatchewan. There are 3 administrative dists.: Mackenzie (527,490 sq. mi.), Keewatin (228,160 sq. mi.), and Franklin (554,032 sq. mi.).

Along the shores of the Arctic Ocean and stretching far inland lies a country covered with a sort of Arctic grass, which has considerable nutritive value. S. of this region are the forest lands, chiefly black spruce, white spruce, and larch. In the W. part of the ter. is the great water system of the Mackenzie, which includes the Athabaska and Slave R.s, with Great Bear and Great Slave Lakes. Great Bear Lake is fourth and Great Slave Lake fifth in size of the lakes of N. America. The Mackenzie R. and its lakes extend 1469 m. N. and S.; with the addition of its trib., the Athabaska, its length is 2525 m. The large alluvial plains of its basin grow vegetables and wheat, oats, and barley; while trees a foot in diameter grow in its delta, within the Arctic Circle.

The fur trade and mining are the chief industries. Furs to the value of \$732,789 were obtained in 1956-7; the most valuable is white fox, and others include beaver, mink, lynx, and red fox. Gold and silver and other minerals are mined on the N. shore of Great Slave Lake in the Yellowknife Region. Uranium concentrates and radium are produced from pitchblende ore at the Eldorado mine on Great Bear Lake. A large oil-field was found in 1943-4 in the Lower Mackenzie Basin, petroleum being produced at Norman Wells. Natural gas is found. Mineral production reached a record of \$9,033,714 in 1952. There is a fishery on Great Slave Lake, and reindeer herding as a native industry is being developed. To aid the development of the N. Ters. a highway of 315 m. is projected from Hay R. to Notikewan in Alberta, and a 8000 h.p. hydro-electric plant on the Snare R. 94 m. NW. of Yellowknife.

The area is 1,304,903 sq. mi. The 1941 pop. was 12,000 (including approximately

2300 whites, 4300 Indians, and 5400 Eskimos); largely owing to increased mining activity the 1955 pop. had risen to an estimated 18,000. See R. Finnie, *Canada Moves North*, 1942, 1947; C. C. Lingard, *Territorial Government in Canada: the Autonomy Question in the Old Northwest Territories*, 1946; N. Polunin, *Arctic Unfolding*, 1948; and the pubs. of the Bureau of N. Terns and Yukon Affairs, Dept. of Mines and Resources, Ottawa.

Northwich, tn of Cheshire, England, on the R. Weaver, 13 m. ENE. of Chester.

in a separation. The unhappiness of her married life led her to interest herself in the amelioration of the laws regarding the social condition and the separate property of women and the wrongs of children. Her poems *A Voice from the Factories*, 1836, and *The Child of the Islands*, 1845, had as an object the furtherance of her views on these subjects. Her efforts were largely successful in bringing about the needed legislation. Her chief vols. of verse are *The Sorrows of Rosalie*, 1829, *The Undying One*, 1830, *The Dream*,



National Film Board, Canada

#### PORT RADIUM, NORTHWEST TERRITORIES

Among the few anct relics in the tn is the picturesque church of St Helen, which belongs to the 16th cent. The chief industry is the manuf. of chemicals, the works being among the most extensive in the world. There are also shipyards, steel works, and iron foundries. The tn was once subject to numerous land subsidences caused by the pumping of the brine used for the manuf. of salt and alkali, but since the introduction of controlled pumping in recent years the subsidence has been negligible. Pop. 20,000.

Norton, Caroline Elizabeth Sarah (1808-1877), later Lady Stirling-Maxwell, poetess and novelist, b. London, the granddaughter of Richard Brinsley Sheridan, the dramatist. In 1827 she married the Hon. George N., a union which ended

1840, *The Child of the Islands*, 1845, and *The Lady of La Garaye*, 1861. Among her novels are *Stuart of Dunleath*, 1851, and *Lost and Saved*, 1863. In 1877 she married Sir W. Stirling-Maxwell after the death of her first husband in 1875. See J. G. Perkins, *The Life of Mrs Norton*, 1909, and Alice Acland, *Caroline Norton*, 1948.

Norton, Charles Eliot (1827-1908), Amer. man of letters, b. Cambridge, Massachusetts, U.S.A. He occupied the chair of hist. of fine art in Harvard Univ. from 1873 to 1898. He was joint editor of the *North American Review* with James Russell Lowell (1861-8), and a founder and co-editor of the *Nation* (1865). His chief works are *Considerations of Some Recent Social Theories*, 1853, an attack on experimental Socialism; *Notes of Travel and Study in Italy*, 1860; and

*Historical Studies of Church Building in the Middle Ages*, 1876. But he will be chiefly remembered for his trans. and studies of Dante's *Vita Nuova* and *Divina Commedia*, and his *History of Ancient Art*, 1891. He also ed. Carlyle's *Reminiscences*, 1887, making good the blunders made by Froude in 1881, and *The Poems of John Donne*, 1895. N.'s *Letters* were pub. in 2 vols. in 1913. See life by S. Norton and M. A. de Wolfe Howe, 1913.

Norton, Mary (1908- ), writer of children's books and short stories, b. London. Trained as an actress, she turned to authorship after her marriage and is best known both in Great Britain and the U.S.A. for her 3 books about *The Borrowers* (1952, 1955, and 1959), the little people who live under the floor.

Norton, Thomas (1532-84), dramatist and lawyer, b. London. He entered Parliament in 1558, and was appointed to the office of Remembrancer of the City of London in 1571. He collaborated with Sackville in the composition of the first Eng. tragedy, *The Tragedie of Gorboduc*, 1561, written in blank verse.

Norton: 1. Tn and par. of Derbyshire, England, 4½ m. from the centre of Sheffield. The church was built (1180) to expiate the murder of Thomas Becket. N. was the bp. of St Francis Chantry (q.v.). Pop. 15,000.

2. Par. and tn of E. Riding, Yorks, England, on the Derwent, 17½ m. NE. of York. It is noted for the training of racehorses. Pop. 4820.

Norton Sound, inlet, 130 m. long, 90 m. wide, at mouth of Hering Sea, Alaska, lying S. of Seward Peninsula. Norton Bay and Godolphin Bay are on the N. shore. None tn is on the N. side of the entrance of the sound.

Norumbega, name of unknown origin, found especially in 16th- and 17th-cent. maps to indicate a region or city on the E. coast of N. America. It is probably mythical, but has been identified with Vineland, the Norse settlement supposed to have been discovered by Ericson or by Karlsefni, the name of which is derived from the legend that grapes were found there.

Norwalk, city of Fairfield co., SW. Connecticut, U.S.A., on Long Is. Sound at the mouth of the Norwalk R. and 13 m. SW. of Bridgeport. Manufs. include hats, clothing, shoes, cellophane products, tyres, name tapes, hardware, machinery, marine pumps, textiles, rubber, plastics, paper, glass products, and cosmetics. There are extensive oyster fisheries, and many shore resorts, including Bell Is., Harbor View Beach, Wilson Point, and many is. N. includes South N. (a railroad junction), Rowayton, Winnipauk, and Silvermine (an artists' colony). Settled in 1649, it was incorporated as a tn in 1651, and as a city in 1893. It was burned by the British in the revolution, and has been an industrial centre since the late 18th cent. N. suffered heavy damage in the flood of 1955, but is rebuilding its business section extensively. Pop. 49,600.

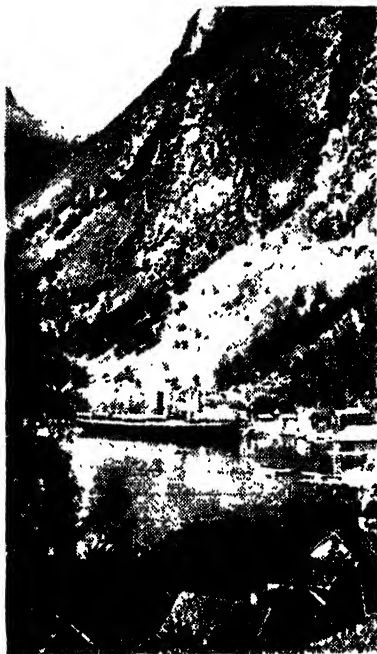
Norway (Norwegian *Norge*), Scandinavian kingdom occupying the W. and N. part of the Scandinavian peninsula. It is surrounded on 3 sides by the sea, on the S. by the Skagerrak, on the W. by the N. Sea and Atlantic Ocean, and on the N. by the Barents Sea. It is therefore cut off from Europe except for the land connection through Russia and Finland. It extends from the is. Kraaka in the SW. (lat. 57° 57' N.) to Knivskjerodden on Mageroy, W. of the N. Cape (lat. 71° 11' N.), in the NE.; and its most westerly point is Husøy in the Sognefjord (long. 4° 30' E.) and the most easterly Kiberg near Vardø (long. 31° 10' E.). The length of the coast, disregarding indentations, is 2100 m.; including the coastline of long inlets and of large is. it is at least 16,400 m., or more than half the circumference of the earth. Area 124,500 sq. m. (8900 being is. or skerries). By the treaty of 1920 Norway was given sovereignty over Svalbard (Spitsbergen) and Bjørnøya (Bear Is.) and, including these, the total area is 155,000 sq. m. In the Middle Ages the kingdom of Norway was twice as large as it is to-day, but much was ceded to Denmark; and at different periods Norway had various trib. lands, such as parts of Ireland, Scotland, the Hebrides, Lapp dists., Greenland, Iceland, and others. Norway has a frontier with Sweden of 1025 m., with Finland of 450 m., and with U.S.S.R. of 122 m., a total frontier of nearly 1600 m. The country is a high plateau, intersected in the SE. by great valleys and in the W. by deep fjords and bays. More than half its surface is over 2000 ft high. The interior is generally so mountainous that the pop. is settled almost entirely along the coast. Only in the great valleys of S. Norway and in the Trondheim Depression is there a high density of pop. inland. Pop. at the end of 1954 was estimated to be 3,408,000, giving a density of about 25 per sq. m. With the exception of some 20,000 Lapps, living in the most remote N. regions, the inhab. of Norway are generally a Scandinavian race, akin to the N. Germanic nations of Aryan descent.

*Physical features.* Certain fundamental physical features characterise the topography of Norway, and variations in their form and type heighten the variety of the landscape. The prin. features are the skjaergaard and the strand flat; the fjords; the gorges; the plateaus, with summits rising above their surfaces; ice-sheets; and valleys, often deeply incised. The skjaergaard is the is. zone of striated rock with but little vegetation. The outer is. are low-lying, but towards the mainland they are higher. The strand flat is a series of rock terraces along the borders of many of the is. and in the mouths of some of the fjords. The fjords have all the characteristics of glaciated valleys, being long, narrow, and straight, with uneven floors. The gorges extend inland above the level of the fjords and torrents flow down from the high uplands in great falls, roaring through the gorges. The plateaus are the upland surface above the gorges and rise steeply from the W. coast



towards the main watershed of Norway, and they are more extensive in S. than in N. Norway.

(a) *Southern Norway.* The great barren plateau known as the fjell occupies the W. part of much of S. Norway. It is diversified by fjords, gorges, and valleys, and its main subdivs. are the viddas Jostedalsbreen and Rørosvidda, collectively known as the Langfjell, and the Dovrefjell, Trollheim, and Rørosvidda, collectively



*Royal Norwegian Embassy*  
MEROK IN GEIRANGER FJORD

the Dovrefjell. The viddas stretch for miles of barren, windswept rock varied with wild moorland and bog and numerous lakes and rivs., which enhance the general desolation. Jostedalsbreen region, lying N. of the Sognefjord, is an immense ice-cap extending over 580 sq. m. The Jotunheim is the wild, mountainous region lying below the Jostedalsbreen and the Bøverdalen on the W., and the Gudbrandsdal on the E. It is a region of towering snow-covered peaks, the highest being Galdhøpiggen (8097 ft), the highest mt in Norway, Glittertind (8041 ft), and Skagastølstind (7887 ft). The Dovrefjell is an area of barren rocky summits with patches of moorland and peaks rising above the general level of the plateau. The highest peaks are Snöhetta (7500 ft),

Rondeslottet (7162 ft), and Storrornden (7027 ft). There are sev. deep forested valleys cutting across the fjell and providing through routes from Oslo. The Trollheim, which extends northward to the Trondheim Depression, is barren and rocky in its highest part, but towards the coast the plateau decreases steeply in height and contains large forested areas. The SE. lowlands consist of the valleys of the great rivs., flowing S. to the Skagerrak and SE. to the Oslofjord, together with the plains lying round their mouths along the coast. It is a pleasant undulating countryside and the rivs., with their waterfalls, are conducive to agriculture and industrial development. The largest of the valleys of this region, the Setesdal, is followed by the R. Otra for 150 m. to its outlet in the Kristiansandsfjord. Other rivs. of this region are the Topdalselv and the Nidelv. Between the viddas and the lowland to the E. is the Telemark, a region of many lakes and riv. valleys, with bare outcrops and patches of conifers. It is broken by 3 main riv. systems. The rivs. feed the Totakvann, characterised by a remarkable series of locks, and the Tinnsjø, which flows in a deep forested valley to the great Rjukan falls. Below Lake Tinnsjø it descends by a series of great falls to the Hitterdalsvann. These rivs flow into the Norsjø and drain into the Langesundfjord by the Skiens R. E. of the Telemark many rivs. flow SE. towards the Oslofjord. The Laagen, flowing through Nummedal, reaches the sea in Larviksfjord. Another similarly named riv. rises in a lake in the heart of the Dovrefjell, flowing into Lake Mjøsa, below which it is called the Vorma as far as its confluence with the Glomma. Lake Mjøsa, largest lake in Norway, lies in an open wooded valley with gently sloping hills on each side. The Glomma, which follows the Osterdal, has a course of 400 m. from its source in the Rørosvidda to its mouth on the E. of Oslofjord. The current of the Glomma is swift and the riv. is used, especially in spring floods, for floating timber. The Dramselv, draining the Tyrifjord (a lake), descends in a broad valley to Høksund where it veers E. and flows through a wide cultivated valley to Drammen at the head of the Dramsfjord. Oslo itself lies in a small depression at the head of its fjord; low hills covered with spruce and pine extend westwards from the city, and northward the hills rise higher to the forest of Nordmarken. The Begna, rising in the S. of Jotunheim, flows through the Valdres valley in a number of lakes and a gorge below the Strandsfjord, joining with the Randselv, and thence descending through a broad valley by a series of rapids.

(b) *Northern Norway.* The main topographical divs. of N. Norway are the Trondheim Depression, the Trøndelag, the Nordland, Troms, the coastal is. between Altafjord and Majerøy, and the plateau region of Finnmark. Towards the S. of the Trondheim Depression are the E. highlands (highest point, Storöla, 5600

ft). The dominant features of the lowlands of the Trondheim Depression are the Trondheimfjord, the Snaasavatn lake (30 m. long), and the Namdal. The country surrounding the fjord and lake is undulating and includes the rich region of good farms and large coniferous forests. The R. Namsen, flowing along the Namdal into the Namsenford, is the prin. riv. of the Trøndelag. The Nordland includes all Helgeland as far N. as Ofotfjord. Sev. snow-fields rise in isolated peaks above the level fjeld, the largest being Sulitjelma (6300 ft) and Blaamannsisen (4800 ft). In the Troms region the E. highlands occupy the coastal part of the mainland. The coast N. and S.E. of the Malangenfjord in this region is cut up into narrow peninsulas which have a wild and grand aspect with mts beeding above the steep slopes of the rugged coast. Finnmark plateau is a vast barren stretch extending from the W. watershed of the Altafjord across the N. part of Norway to the Finnish and Russian frontiers. The coast is formed by low cliffs unscreeled by is. and exposed to the Arctic. The chief fjords are the Altafjord, Porsangerfjord, Laksefjord, Tanafjord, and Varangerfjord. All cut deeply southwards into the plateau, except the Varangerfjord, which runs W. The plateau is dissected by numerous rivs., of which the Alta, Tana, Neldon, Munkelv, and Pasvik are the chief. The Tana and the Anarjokka, its confluent, form the frontier with Finland for 150 m., the Pasvik for 60 m. The Munkely, which rises in Finland, has only a few miles of its course in Norway.

(c) *The coasts.* The remarkable development of fjords results in a coastline of amazing complexity. The rugged shores often rise in sheer walls of rock from the water's edge, which restricts navigation to a few well-defined routes. A screen of reefs fringes the mainland between Cape Lindesnes (the most southerly point of the Norwegian mainland) and the Skien R. Cape Lindesnes is a craggy headland at the end of a rocky forested peninsula. There are no large fjords extending far inland in this part of the coast such as are to be found on the W. coast, but there are many inlets, of which Kristiansandsfjord and Toppalsfjord together form the largest. The Oslofjord extends N. from the Skagerrak for 60 m. from 59° N. lat. Its shores are not very steep and the outer part is undulating forested land. It is a region of numerous scattered farming communities, with some large industrial tns. (Drammen, Tønsberg, Oslo, Halden, etc.). From Cape Lindesnes north-westward are the Rosfjord and Grønsfjord with steep rugged shores, the Lyngdalsfjord and Listerfjord each side of the Lister Peninsula, characterised by a steep coast as far as Ana-Sira, craggy and treeless NW. of that place. The coast of Jaeren is unlike any other part of the Norwegian coast, there being no is. or fjords, though on the Stavanger Peninsula there are some is. and large inlets. The Haugesund Peninsula is divided into distinct regions by sev. narrow fjords which are generally frozen in winter.

The Hardangerfjord penetrates the mainland for 70 m. in a NE. direction, while the main branch, the Sörfjord, runs SW. for 24 m. There are extensive farmlands along both shores of the Sörfjord. Between the Hardangerfjord and the Sognefjord (about 80 m. N. of the Hardangerfjord) the coast is characterised by channels and lesser fjords, which form numerous is. and peninsulas and a most irregular coastline. Bergen is the nodal point of this region and lies sheltered at the foot of steep hills. The Sognefjord extends eastward into the mainland for about 100 m. and is for the most part narrow. The fjord on each side increases from 2000 ft to 5000 ft at the landward end and many streams flow into the fjord. Cultivable land here is rare. The coast of Salten from the Lofoten Is. is pierced by large fjords, which almost touch the Swedish frontier. The whole coast here is a labyrinth of complicated channels running between is. and promontories.

*Climate.* There are striking differences in the Norwegian climate, which changes markedly from the coast inland, or from W. to E. Apart from general influences such as the ocean, altitude, and lat. the weather of Norway is controlled by depressions along its shores. Most pass along its W. shore and bring S. and SW. winds on the coasts. Less often they pass along the S. coast and into the Baltic, while some cross the peninsula in the region of Trondheim. In winter the lowest temps. are experienced in Finnmark and around Røros, i.e. in the country furthest from the sea or from the influence of the Gulf Stream. At the latter place, for the first 3 months of the year, the temp. rarely rises above freezing point. Some of the coastal waters have quite mild winters. The highest temps. are to be found in the valleys immediately N. of Oslo, the July mean being 63° and the absolute maximum as much sometimes as 95°. Frost is frequent in all but the outer coastal areas. There are great contrasts of rainfall due to distances from the sea and altitude. The coastal mt region has a high rainfall. In the regions near the N. Cape storms are almost incessant, and rage with great violence. In the W. there are areas with falls up to 120 in., but at no great distance from the coast falls of 10-12 in. are common. Winter temps. decrease northwards, and N. of Trondheim the monthly mean is below freezing-point until spring, and on the mild W. coast snow falls on about 40 days in the year, but inland there is naturally a higher snowfall. Sev. of the mts rise above the limit of permanent snow. Fog is frequent on the S. coasts. In winter it is less widespread in the interior and is concentrated mainly in the E. valleys. The longest day, which in the S. is 18 hrs. may be said to be nearly 3 months in the high lats. of the N. dists, where the longest night lasts almost an equal length of time. The protracted winter of the N. regions follows quite suddenly on the disappearance of the sun, whence the absence of solar light is compensated for by the

frequent appearance of the aurora borealis, which shines with sufficient intensity to allow of the prosecution of ordinary occupations (*see also* MIDNIGHT SUN).

**Flora and fauna.** Norway has a luxuriant vegetation, despite its N. situation. It lies mainly within the area of coniferous forests, which are characteristic of cool temperate regions. Vegetation in the N. and on the fjell of W.-central Norway consists chiefly of shrubs, arctic plants, and mosses. The richest vegetation is round the Oslofjord and the great lakes

few plants of economic value in Norway, but seaweeds have some value for their salts of iodine. Peat bogs are extensive. The most characteristic of the arctic animals of Norway are the reindeer, arctic hare, arctic fox, lemming, and wolverine. These are found throughout most of N. Norway. The reindeer are largely tame and are herded by Lapps, but there are wild reindeer in Finnmark and in the mts of central and S. Norway. Lemmings migrate in great numbers towards lower land, pursued and destroyed in equally large numbers by wolves,



Norwegian Travel Bureau

#### TRYVANNSSIVA AND SKI-RUN

Mjøsa, Randsfjord, and Tyrifjord. Scotch pine and Norway spruce are the most important conifers. In the coniferous zone very little other vegetation can survive, but in the bogs and marshes are sphagnum, ling, bilberry, and cloudberry. Willow and lichen grow in the fjell region of the SW. There are no trees in the willow zone. Dwarf birch and willow shrub, however, form a dense growth of bushes. Reindeer moss predominates in the lichen belt. Herbaceous arctic plants also grow in the willow and lichen belts. The white *Ranunculus glacialis*, a food for reindeer, occurs on high mts. The fjords of W. Norway are barren and their sides afford little soil for vegetation. In the Trondheim Depression spruce is the predominant tree. N. of that region birch is the important forest tree. With the exception of the forest trees there are

foxes, and hawks. The wolverine or glutton is valuable for its fur. The elk, red deer, roe deer, and reindeer are the only wild ruminants. The elk (q.v.) is found in most of the forest regions of E. Norway. The bear, lynx, wolf, fox, otter, and various species of marten were until recently widespread and numerous, but the larger beasts of prey are now rare. The bear is almost exterminated and only found immediately N. of Trondheim. The badger occurs in SE. and S. Norway. The beaver has almost died out. The white whale appears off the N. shores. Bearded seal and walrus sometimes visit the far N. Reptiles include the lizard, slow-worm, and common viper. Most Norwegian birds are migratory. Those which breed in Norway are geese, wader, crane, curlew, snipe, sparrow, and falcons. The mild climate of the S. and W. causes

birds such as the starling, blackbird, woodcock, duck, and swan to winter there. Along the W. and N. coasts there are numerous colonies of sea-birds, including gulls, terns, guillemots, razor-bills, puffins, kittiwakes, cormorants, and eider ducks. Other coastal birds are sheldrake, heron, lapwing, oyster-catcher, and sea-eagle. Lowland birds are thrush, kestrel, skylark, jackdaw, wren, and corn-crake. The most important game-bird in the lowlands is the partridge. On the higher land are black grouse, willow grouse, blackcock, capercaillie, and ptar-



*Royal Norwegian Embassy*

#### HARDANGERFJORD, WESTERN NORWAY

migan. Black duck, golden plover, and ruff are found by marshes and lakes. Other common birds are the swallow, bullfinch, golden eagle, crow, blue-tit, and magpie. Fish occur in most of the rivers and lakes. The commonest in the W. and N. coast rivers are char, salmon, and trout. Grayling, perch, pike, turbot, and other fish of E. and central European origin occur in the waters of E. Norway. The sea fish include finbacks (rorqual), dolphin, porpoise, cod, pollack, haddock, whiting, ling, herring, and sprat. Mackerel and tunny are the only S. visitors which disappear in the winter. The Greenland shark comes into the fjords and coastal waters.

**Production and industry.** The occupations of the Norwegian people are to a very large extent determined by the natural conditions of the country. Agriculture plays so important a part that Norway was almost entirely an agr. country until the beginning of the 20th cent., when hydro-electricity was first used for large-scale industry. Since then, with abundant cheap power, many manufacturing industries have grown up,

notably the electro-chemical and electro-metallurgical, although most raw materials have to be imported. At the end of 1957 the total production of electricity amounted to 23,500,000,000 kWh., nearly all produced by hydro-electric plants, about a fifth of the available water-power being developed for electricity production. About 95 per cent of the pop. have electricity in their homes. About 713,000 are occupied in agriculture and forestry; 182,000 in fishing and hunting; 1,125,000 in industry and building; and 600,000 in commerce and transport. Norway, being barren and mountainous for the most part, has not a great acreage under crops. In 1955 the harvest was 345,000 tons grain, 1,005,000 tons potatoes, 740,000 tons other root crops, 109,000 tons other vegetables, 2,420,000 tons hay, 80,000 tons fruit. Norway is self-sufficient in meat, dairy products, and eggs. The forests are one of the chief natural sources of wealth. There are 29,000 sq. m. of forest land, largely under pine, and state forests cover 5200 sq. m. The essential part of the growth is used in the paper industry.

Pyrites and iron ore are the chief minerals; but silver, copper, nickel, zinc, lead, and molybdenum are among the ores and minerals found, while among other metals and alloys are aluminium and ferro-alloys, etc. The distribution of deposits is fairly generally spread over the country, with perhaps a preponderance in the N. part. The output of the sea-fisheries is large, totalling about 1,900,000 tons a year, of which well over half is herring and much of the remaining cod. Norway is traditionally the biggest participant in Antarctic whaling. Output of whale oil in the 1954-5 season was 869,000 barrels.

Industry is chiefly based on the primary products of the country (wood and fish) and on water-power. The pulp and paper industry, the canning industry, and the electro-chemical and electro-metallurgical industries are the most important from the export standpoint. Trade in 1957 was valued at 9,100,000,000 kroner for imports and 5,868,000,000 kroner for exports. Exports from Norway to the U.K. in 1957 were 1,171,000,000 kroner, and imports from the U.K. 1,686,000,000 kroner. The registered Norwegian mercantile marine (as at 1 July 1958) was (ships over 100 gross tons only) 2716 vessels totalling 9,394,000 gross tons. Ships on order or under construction totalled app. 1,000,000 gross tons. The merchant fleet is the third largest in the world. More than half consists of tankers. The earnings help to bridge the gap between imports and exports. The railway network comprises 2700 m. of normal track and 140 m. of narrow-gauge track. About 700 m. are electrified. Aviation is largely by Scandinavian Airlines System, a consortium of the prin. airlines of Norway, Denmark, and Sweden. There are also some independent companies operating certain domestic and shorter flights.

Total state revenue and expenditure

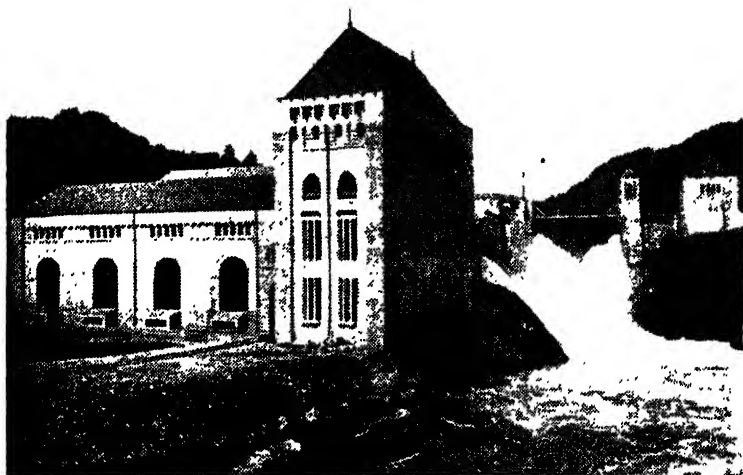
in the budget year ending 30 June 1958 were, respectively, 5,469,000,000 and 5,531,000,000 kroner.

The chief tns in order of size of pop. are Oslo (the cap., formerly Christiania), Bergen, Trondheim, Stavanger, Drammen, Kristiansand, Haugesund, Alesund Moss, Skien, Kristiansund, Frederikstad (qq.v.).

**Constitution and government.** The constitution of Norway is dated 17 May 1814, and has been modified since that date. It vests the legislative power in the Storting (Parliament), the representative of the sovereign people. The

session and the final decision goes by a majority of two-thirds. The same majority is required for alterations in the constitution. The executive is represented by the king, who exercises his authority through a council of state (Statsraad). The ministries are entitled to be present in the Storting and to take part in the debates, but may not vote.

**Religion and education.** The evangelical Lutheran religion is the national Church and the only one endowed by the State. Its clergy are nominated by the king. All religions are tolerated, the ban



*Royal Norwegian Embassy*

ARLIFLOSS POWER STATION, TELEMARCK COUNTY

royal veto in regard to Acts may be exercised twice, but a Bill which passes 3 separate Stortings becomes law without royal assent. Every Norwegian subject of 21 years of age, subject to residential qualification, is entitled to vote. Since 1938 the electors have chosen their 150 representatives every fourth year. A system of proportional representation is used, with multi-member constituencies. By a law of 1938 all branches of the gov. services, including the State Church, are open to women. The Storting, when assembled, divides itself by election into 2 sections, the Lagting and Odelsting. one-quarter and three-quarters of the members respectively. Questions relating to the laws must be considered by each section separately. All new laws must first be laid before the Odelsting, from which they pass into the Lagting for acceptance or rejection. If the 2 sections do not agree, they assemble in common

on Jesuits being lifted in 1956. There are about 125,000 dissenters.

Education is compulsory from the age of 7 to 14 years. In 1955 there were 5069 primary schools in the country dists., with 291,000 pupils, and 182 in the tns, with 109,000 pupils. Most of the 280 secondary schools are mixed. Norway has 2 univs.: at Oslo (founded in 1811) and at Bergen (opened in 1948). There is a univ. college of science and technology in Trondheim, a univ. college of commerce in Bergen, and a univ. college of agriculture near Oslo. There are sev. high schools, special schools, technical, art, industrial, and craft schools, a veterinary college, and a teachers' training college.

**Defence.** The army of Norway is a national militia. Service is compulsory and universal, liability commencing at 18 and continuing till 55. The initial service period is 16 months in the army and 18 months in the navy and air

force. There is a Home Guard of about 100,000 men. The navy is composed of small vessels, none larger than a destroyer. The air force consists chiefly of fighter squadrons using U.S. aircraft. Since the Second World War, and especially since joining N.A.T.O., Norway has built up an effective, modern defence force, aided by U.S. military aid and N.A.T.O. intra-structure contributions.

*History.* There is good evidence of the presence of sub-Palaeolithic man in N. Norway, and modern research has been directed to the prov. of Finnmark, where traces of the earliest settlers in Scandinavia have been found on the banks of the fjords.

The Vikings play a part in the obscure and somewhat fabulous early hist. of Norway, which is comprised in that of other Scandinavian countries. The Viking period, however, ended early in the 10th cent. with more settled conditions in Norway, and its conversion to Christianity. The sea-rovers were, moreover, never more than a fraction of the people, most of whom were peaceable farmers and fishermen. Harald Haarfagre (Harald the 'fair-headed') was the first to bring all the settled parts of Norway under one rule. He was descended from the kings of Vestfold, a dist. W. of the Oslofjord, and was son of Halfdan the Black who ruled further N. He began to reign some time after 866, and from his time the hist. of Norway is comparatively full and authentic. When his own inherited kingdoms were secure, Harald, fired by Charlemagne's example, marched into and subdued the Trondheimers. But it was only after sev. more years that he routed the chiefs of the W. coast in a great battle at Hafsford near Stavanger. His defeated enemies had to take an oath of fealty to him, and the fylke-kings (the *fylker* were the old tribal divs.) were replaced by *jarks*, removable at his pleasure. Harald d. c. 933 and left his kingdom to be divided among his many sons, making Erik, his favourite son, a sort of suzerain. Erik at once tried to secure all for himself, and to that end murdered 2 of his half-brothers. In 934 Haakon, a younger son of Harald, was summoned from England and, with the help of Sigurd, drove Erik into flight from Norway. Haakon restored to the Norwegians the rights and liberties of which they had been deprived; but although his attempts to convert his subjects to Christianity failed, his reign was for the most part peaceful despite a dangerous relaxation of central control. In 961 Haakon was killed in combat with Dan. invaders led by Erik, and in the ensuing years Norway was much disturbed until the arrival of Olaf Trygvason, grandson of one of the murdered half-brothers of Erik. Olaf, who had been a well-known viking leader and was a man of splendid physical endowment and great energy, was the founder of Nidaros (later called Trondheim), for many years the Norwegian cap. After a reign of only 5 years he perished in a sea-fight with Dan. and Swedish ships under

Earl Erik, son of Haakon, and the kingdom was then divided for the most part between the Swedish and Dan. kings and Earl Erik. Another seafaring king like Olaf Trygvason was Olaf Haraldson, a descendant of Haarfagre, who came to the throne as Olaf II c. 1015. Olaf II's policy was the double one of establishing both the royal power and the Christian Church on a national basis in opposition to the local chieftains who were claiming dists. by hereditary title. But though he strictly enforced the laws and gave Norway comparative stability, he too was doomed to perish at the hands of his foes, being killed at the battle of Stiklestad (1030). This victory, however, served to increase the influence of Denmark, whose king, Knut (Canute), sent Svend Knutson to rule as viceroy. On Knut's death in 1035 Knutson was expelled and Magnus, son of Olaf II, was brought from exile in Russia. Olaf II is commonly reputed to have been the first to awaken a national consciousness and came to be regarded as the national champion, while his zeal for the Church sanctified his memory, so that later he was extolled as the patron saint of Norway. On Hardeknut's death (1042) Magnus inherited the crown of Denmark. He made his nephew Svend Estridsen his viceroy, but the latter, with the aid of Harald Haardraade, tried to secure his own independence. Haardraade, who was a half-brother of Olaf and a great warrior, came to terms with Olaf and together they ruled Norway. Under Olaf III (Olaf Kyrre), son of Haardraade (killed at Stamford Bridge, 1066), Norway enjoyed peace and prosperity. Sigurd, a son of Magnus, was the last of the line of Harald Haarfagre to wield undisputed sway over Norway, and with his death ended what has been called the classic period of Norwegian history.

After the death of Sigurd there ensued a long period of intestine strife over rival claims to the throne, and in these conditions the power of the aristocracy and the political influence of the Church both tended to grow at the expense of the king. When Magnus V, son of Erling Skakke, who was not of royal blood, was chosen king in 1161 it was thought expedient that the Archbishop of Trondheim should crown him and thereby at least make the kingship nominally dependent on the goodwill of the Church. In 1184 Magnus was defeated and killed on the Sognefjord by the Birkebeinar, desperate armed followers of Sverre, who claimed to be of royal descent. Sverre, an able and strong ruler, set out to make the royal power supreme over both national Church and State, and his efforts to achieve his purpose were largely successful by the time of his death (1202). Pretenders to the throne were not finally crushed until 1240. Haakon Haakonson (Haakon IV), however, succeeded Sverre and ruled until 1263. It was during his long reign that Iceland became directly dependent on Norway, but an attempt to bring the Hebrides and other Scottish is. into the same relationship utterly failed, and they were ceded later to

Scotland by Magnus VI, in whose reign the relations of the Crown with the old aristocracy were to some extent improved. Erik, his son and successor, *d.* in 1299. His only child, the 'Maid of Norway,' was drowned on the way to Scotland and the crown then passed to Haakon Magnusson (Haakon V), his brother. Haakon V left no son and the crown then (1319) passed through his daughter to the reigning house of Sweden. The child Magnus VII, hereditary King of Norway and grandson of Haakon V, was elected King of Sweden in 1319, so that the 2 kingdoms became nominally united. From that time until the 20th cent. the hist. of Norway is inextricably interwoven with that of other parts of Scandinavia. The union, accidental in its origin, was so unsuccessful that it was arranged that Haakon, younger son of Magnus, should reign over Norway. Haakon VI *d.* in 1380 and Margaret, his wife, daughter of Valdemar, King of Denmark, acted as regent in both countries, even after her son's (Olaf) death in 1387. In Sweden Albert of Mecklenburg, who had been chosen to replace the deposed Magnus, became so unpopular with his nobles that they asked Margaret to assume power, and in 1389 Albert was defeated by her army at Falköping and Margaret was now *de facto* mistress over all Scandinavia, while in 1397, by the union of Kalmar, the 3 countries were declared to be 'eternally' united under one sovereign.

After 1412 Sweden revolted against the union because the more important posts were held by Dan. nobles. Christian of Oldenburg (Christian I), who succeeded to the crown of the 3 countries in 1448, could not establish his power over Sweden, and in 1523 Sweden finally seceded from the union. In 1525 the Danes set up the Duke of Holstein as king with the title of Frederick I, but his zeal for Lutheranism made enemies of the Church in Norway. Frederick *d.* in 1533 and Christian III was chosen king by the Dan. council. He, too, was an extreme Lutheran, but an attempt by the opposition, under Archbishop Olaf Engelbriktsson (or Engelbrechtsson), to reject him having proved abortive, Norway became practically a prov. of Denmark, the people, who were scarcely more numerous than in the years preceding the Black Death, being too scattered in remote settlements to have any true understanding of political conditions. Thus Norway had to all intents ceased to exist as a sovereign state and for a long time appeared only in Dan. hist. It was concerned only indirectly with the wars in which Denmark, under Christian IV, became involved, but its actual disintegration seemed to be imminent when, in the disastrous war of the Danes under Frederick III, Trondheim was lost to the Swedes (1658). But the Norwegians asserted themselves and most of the lost ter. was soon recovered. Norway's fortunes began to revive with the growth of her maritime trade during the wars of the Dutch with the English and French. But in 1717-18 Norway was invaded by Charles XII of Sweden, whose purpose

was to obtain a portion of ter. with which to negotiate peace with his enemies; but in the result Sweden's power was so weakened that she no longer constituted a threat to her Scandinavian neighbours.

During the Napoleonic wars Norway was faced with economic chaos and famine owing to her dependence on blockaded Denmark. In 1810 the Fr. marshal, Jean-Baptiste Bernadotte, was made Crown Prince of Sweden as Karl Johan and, the old king (Charles XIII) being infirm, Bernadotte became the effective power. Bernadotte's rule was popular in Sweden owing to his kindness to Swedish prisoners during the war with Denmark. But as King of Sweden he was almost necessarily led into tortuous ways and now made the acquisition of Norway the keystone of his whole policy, his aim being to divert the popular ambition of Sweden from the conquest of Finland. This project received support from England and other powers in consideration of Sweden's aid against Napoleon. Norway was then again the victim of blockade, and national bankruptcy soon followed. After his success at Leipzig Bernadotte defeated the Danes, and under the ensuing peace treaty of Kiel (1814) the King of Denmark renounced all rights in Norway, though the Norwegian dependencies, Iceland, Greenland, and the Faeroes, were reserved to Denmark. The Norwegian people, however, who were not consulted on this arrangement, were intensely hostile to it. The result was that Prince Christian Frederick, next in succession to the Dan. king, was sent to Norway as regent. He soon abdicated, and Norway was at length declared 'a free, independent, indivisible, and inalienable kingdom united with Sweden under one king,' under the Act of Union of 6 Aug. 1815. This second union with Sweden, which was maintained from 1815 to 1905, was purely personal in the sense that the king was the sole connecting link.

The 2 states had their separate and very different systems of gov., defence, finance, and laws, and their economic and political interests were diverse and often antagonistic. The Norwegian view was that the 2 states were intended to be on a footing of absolute equality, but the Swedes claimed that Norway was no more than ceded ter. enjoying only a nominal autonomy. Only after the accession of Oscar II in 1872 did the situation become less strained. Under the Liberals, in 1883, the king yielded to the Norwegian desire that the ministers and state councillors should have the right of access to the Storting and of participation in its debates, thereby establishing ministerial responsibility in Norway. But Norway still had no foreign minister and claimed that her divergent economic interests entitled her to have separate consular services. In 1892 and 1898 these questions brought Norway and Sweden to the verge of war. In 1905 the Norwegian ministry of the day resigned following the king's (Oscar II) veto of a measure for a separate and independent Norwegian consular service and his

refusal to form another gov. The Storting then claimed that Oscar had abjured his constitutional functions and ceased to be King of Norway, and that the union with Sweden was at an end. This was confirmed by a Norwegian referendum by 259,563 votes to 69,264 against, and a treaty was signed at Karlstad, 6 Oct. 1905, defining the terms of separation, including the delimitation of a 'neutral' zone, and Norwegian fortifications were dismantled. There was a small popular demand for establishing a rep., but the peasantry were one strong factor against it, and the Storting chose Prince Charles, second son of the then Crown Prince Frederick of Denmark, to be king. He was elected by referendum (18 Nov. 1905) and was crowned King Haakon VII (q.v.) on 22 June 1906, in Trondheim Cathedral. Princess Maud Charlotte, the youngest daughter of Edward VII of England, his consort, became queen.

In the First World War Norway adopted an attitude of strict neutrality, but her timber and mining industries suffered heavy losses and the national debt increased enormously, speculation became widespread, wages rose with the cost of living, and this economic confusion was enhanced by the fall of the currency. Victories at the election of 1927 gave the Labour party 50 representatives in the Storting and a Labour gov. was formed in 1928, but it soon went out of office with the threat of complete disarmament and financial chaos. Unemployment reached its highest point during the time of the Liberal gov., under Mowinkel (1933), and when this gov. was defeated it was succeeded in 1935 by an all-Labour gov.; but the Labour party had learned its lesson and increased the vote for defence (1937). In 1920 Norwegian sovereignty over the Spitsbergen Archipelago (known as Svalbard) was affirmed by international treaty. A long-standing dispute over Greenland came before the International Court of Justice at The Hague, but the court upheld Denmark's claim (1933). In 1939 Norway annexed part of the Antarctic coast between 20° W. and 45° E., the land within, and its territorial waters.

On 9 April 1940 the Ger. minister at Oslo presented a series of demands to the Norwegian Gov., e.g. that the gov. should appeal to the people and army to refrain from resisting the Ger. troops. But already, sev. hours before these demands were delivered, Ger. forces had begun the attack on Norway. Norway refused to submit to the Ger. demands. Naval and military operations were carried on against overwhelming odds by the brave Norwegian Army, assisted by Brit. and Fr. forces until 10 June. After the Germans opened their offensive on the W. front the Allies gave notice that they must withdraw their forces from N. Norway. The Norwegian Gov. decided therefore on 7 June to end the defence of N. Norway 2 days later at midnight, and continue the fight outside Norway. The king and members of the Norwegian Gov. took over the administration, assisted by

an administrative council. On 25 Sept. the Ger. Reich's commissar for Norway by a decree excluded the king, the legal gov., and all political parties, and estab. a council of commissars of the Quisling (q.v.) party. On 1 Feb. 1942 the Ger. commissar appointed Vidkun Quisling, the notorious Norwegian traitor, as 'minister president' of a puppet gov., an appointment at once repudiated by the *de jure* Norwegian Gov. in London.

One of Quisling's first acts in the interests of his new masters was to attack the schools and teachers in the vain hope of 'nazifying' them; but, apart from alienating the teachers, he came into conflict with the State Lutheran Church. He also tried to establish a corporative assembly, called the *Rikssting*, on the model of the Ger. *Arbeitsfront*, but most of the workers resigned from the trade unions which were to form the new labour front and Quisling had to abandon his plan. The usual Ger. repressive measures, as put into operation in other occupied countries, followed in 1943 in the shape of concentration camps, labour conscription, and police purges. But from outside Norway the Norwegian Gov. continued to direct the growing participation of Norway in the allied war effort. The Norwegian Navy was strengthened by an increase in its personnel to over 5000 men. Corvettes carried out much convoy work; Norwegian fighter planes had shot down 137 Ger. planes by the end of 1942, and the Norwegian Army continued its intensive training. In the years of the Ger. occupation the financial burden on Norway was very heavy, and was higher in proportion to the pop. than in any other occupied country.

In Oct. 1944 the Red Army, pursuing the retreating Germans from Finland, crossed the Norwegian border and took Kirkenes, the vital base from which the Germans had directed their attacks against the convoys to Murmansk. They soon cleared the Varanger Peninsula, and by the close of the year nearly half of the co. of Finnmark was liberated. Inside this area some 25,000 Norwegian civilians, who had succeeded in evading compulsory evacuation, set about the task of repairing their damaged towns and villages. Norwegian forces all through 1944 helped not only in preparations for the liberation of Norway, but also in the general allied offensives against the Reich. On 7 May 1945 Gen. Böhme, Ger. commander-in-chief in Norway, broadcast Germany's surrender, and the Norwegian home forces took over strategic points all over the country. By Sept. some 225,000 Germans had been evacuated; the Russian forces in N. Norway returned home in the same month, while Amer. and Brit. forces left before the end of the year. King Haakon returned to Oslo on 7 June. After the liberation the collaborators were brought to justice. Quisling himself, and others, were executed. Knut Hamsun, the novelist and Nobel prize-winner, who had actively supported the Germans, was arrested, but the capital charge against him was dropped because of his mental deterioration; he was heavily fined. In



the parl. elections of Oct. the Labour party, already the largest in the Assembly, increased its representation to 76 out of 150, thus securing a majority over all other parties.

Reconstruction was soon set on foot. Hydro-electric and industrial development was undertaken on a scale never before attempted in Norway. The merchant, whaling, and fishing fleets were rebuilt after heavy war-time losses. Agriculture was mechanised. Clearly, however, Norway could not plan in isolation, and the main problems lay in the field of collaboration with Scandinavia and the W. nations. Norway had been a member of U.N.O. from its inception, and a Norwegian, Trygve Lie, became first secretary-general of the organisation in Feb. 1946. In Feb. 1948 Norway announced her agreement with the aims of Marshall Aid (q.v.), and undertook to participate in the economic co-operation of the 16 Marshall Aid countries. There was also set up a Joint Nordic Committee of N. Denmark, Sweden, and Iceland for economic affairs and to consider the estab. of a Northern Customs Union. In Oct. 1948 Norway received from the Economic Co-operation Administration a loan under the European Recovery Programme of \$35,000,000. The total of Amer. aid in 1948-9 amounted to \$84,000,000. Norway also entered into the intra-European payments scheme. A joint Anglo-Norwegian committee was estab. in Mar. 1949 for mutual co-operation on economic matters.

In matters of political alignment it was ultimately estab. that Norway would take her place amongst the W. nations. Although in 1947 a 3-year plan for the reorganisation of defence had been drawn up, the experiences of Ger. occupation decided that Norway must seek security, as well as economic stability, in concert with others. This did not, however, prevent the rejection of an Amer. proposal to place Antarctica under international administration; Norway expressed her readiness to participate in international scientific exploration of the area, but wished to retain the sovereignty of her sector. Negotiations were opened in Nov. 1948 to set up a military pact for the collective defence of Norway, Sweden, and Denmark, but a fundamental difference of view became apparent. Sweden, who had been able to preserve her neutrality in the Second World War, and who was, moreover, so closely situated to Russia, wished this union to remain strictly a neutral bloc; Norway, a Ger.-occupied land, and with a geographically Atlantic outlook, insisted that she was a part of W. Europe. Denmark's views were midway between the two, but nearer that of Norway. Ultimately, therefore, the plan was abandoned, and Norway joined the N. Atlantic Treaty (q.v.), which later she ratified in July 1949. Simultaneously with the decision Norway rejected, as being unnecessary, a Russian proposal for a non-aggression pact. In May Amer. defence assistance was requested in accordance with the principles

of the treaty. In May 1949 Norway signed the Statute of the Council of Europe. In the election of Oct. 1949 the Labour party was again returned to power, with a further accession of strength at the expense of the Communists, who did not win a single seat, and was returned to power again, though with a reduced majority, in 1953. Haakon VII d. in 1957, and his death occasioned widespread and deep mourning over all Scandinavia. He was succeeded by his son, Olav V (q.v.). In the general election held in 1957 the Socialists were again returned to power. See also article on NORDIC COUNCIL.

*Literature.* The literature of Norway cannot be taken as a whole; for the old sagas, the poetry, and historical legends were written in Old Norse, which was the language of the colonists of Iceland from Norway, and is so bound up with Icelandic literature that it cannot be separated therefrom (see ICELAND, *Literature and Language*). Similarly, till well on into the 19th cent. the sources of Norwegian literature must be found in Denmark and in Dano-Norwegian, though many of the greatest writers, such as Holberg, Tullin, and Wessel, were Norwegians by birth. The separation of Denmark from Norway constitutionally in 1814 must be the starting-point in a brief outline. The poets of 17 May 1814, the inaugural day of Norwegian independence, the 'Trefold', Conrad Schwach (1793-1860), Mauritz Hansen (1794-1842), and Henrik Bierregaard (q.v.) (1792-1842), did much for the new school; but the greatest early figures were Henrik Wergeland (q.v.) (1808-45), a poetic genius of national tradition who also preached universal values, and his great opponent Johann Welhaven, classicist and conservative (1807-73). Wergeland's sister, Camilla Collet (q.v.) (1813-95), was an early realistic novelist, and her great novel, *The Governor's Daughters*, is a landmark in the women's suffrage movement. The most important event in 19th-cent. literature, however, was the national revival. It was a period of large-scale rediscovery of the old medieval songs and tales. Perhaps the most significant work was done by the linguist and vernacular poet Ivar Aasen (q.v.) (1813-96), who traced the connection between the various dialects and Old Norse and whose grammar and dictionary form the basis of the *Landsmaal* movement which aims at eventual unification of the dialectal elements in Nynorsk and what is known as Samnorsk. Aasmund Vinje (1818-70) wrote fine lyrical poems in the vernacular medium, and, incidentally, wrote a report on Britain, *A Norseman's Views on Britain and the British*, 1863.

Of the next period the great names are those of Henrik Ibsen (1828-1906) and Bjørnstjerne Bjørnson (1832-1910) (qq.v.), whose reputation and influence were world wide. Ibsen's first plays, such as *Warriors at Helgeland*, 1857, borrowed their themes from national legends; but the early *Lady Inger*, 1855, with its strong characterisation, more clearly foreshadowed his later triumphs. Naturalism

of dialogue and situation, adherence to the unities of time and place, the disappearance of soliloquy, the avoidance of the conventional happy ending, are all so familiar to-day that we are apt to forget that these fundamental changes are due to Ibsen. One strong ground of criticism of Ibsen was that he seemed unable to keep away from the topic of disease in its hereditary aspect, as in *Ghosts* which appeared in 1881, and, again, that his philosophy of life was too uncompromising. But whether his beliefs were justified or not, he swept away the fashionable, complicated plots which had no relationship to everyday life. Björnson gave life to conventional characters, but never shook off Scribner's (q.v.) influence. Like Ibsen he took the problems and tragedies of everyday life as themes for his later plays, such as *Leonarda*, *The Editor*, and *A Bankruptcy*. But Björnson handled his themes differently from Ibsen and was essentially a humanitarian whose views were obvious, while he manifold evidence to prove a case. He lacked Ibsen's concentrated technique and creative imagination; but the passionate honesty of his own character was expressed in the appeal in his plays for less casuistry and more truth. His novels are generally on pastoral life and contain some of the most delicate pictures of peasant life in modern fiction.

Of this period was also Jonas Lie (q.v.) (1833-1908). He was not a great creative artist, but stories such as *The Commodore's Daughter*, 1892, and *Dyre Rein*, 1896, are skilfully narrated and show great power in identifying himself with the peculiarities of Norwegian sentiment. His style, almost too colloquial, lacks the charm of Björnson and the art of his successors. Alexander Keilland (1849-1906), a writer with a subtle ironic touch, wrote novels of great force and vitality, attacking social and moral prejudices. A few years younger is Arne Garborg (q.v.) (1851-1924), who was early the recognised leader of the *Landsmaal* movement.

Modern Norwegian literature has not surpassed the high level of that of the last decade of the 19th cent. Though there are many well-known names, they have not reached the international standard of Ibsen, Björnson, Garborg, or Lie. The form chiefly adopted has been the novel, especially the naturalistic, inspired by Fr. and Russian models, and poetry has occupied an important place. Out of this transition period rises the most dominating modern figure in Norwegian literature, that of Knut Hamsun (q.v.) (1859-1952). His work is characterised by its vitality and extreme subjectivity. *Pan*, 1920, has a great poetic beauty. *Markens Grøde* (*Growth of the Soil*), 1920, a study of man against nature, is his greatest novel. Almost equally popular is Johan Bojer (q.v.) (1873- ), the sober pragmatist and the antithesis of prose-poets like Hamsun and Hans Kinck. He is typically national in thought and language. With a greater depth and veracity than Bojer, though lacking his narrative style, is Sigurd Christiansen (1891- ).

Kinck (q.v.) (1865-1926) is regarded as the conscious linguistic artist who seeks his character studies in the peasantry of the fjord dists. His best-known novels are *Sneskavlen brast* (*The Avalanche*), 1918-19, and *Driftkaren* (*The Cattle Dealer*), 1908. A calmer mentality pervades the work of Trygve Andersen (1866-1920), whose prose style of classical purity matches the monotony of his themes. His *Cancelliradens Dage*, 1897, short stories, and *Mot Kveld*, 1900, which treat of aspects of social decay, are his most notable works. Peter Egge (q.v.) (1869- ), who, like Strindberg, is for ever dwelling on the personal conflict between man and woman, also enjoys considerable popularity. Amongst his prolific writings are *Inde i fjordene* (*By the Deep Fjords*), 1920, *Joegting og hans Gud* (*Joegting and his God*), 1920, and *Hansine Solstad*, 1929. Of the still more recent novelists, the best known is Sigrid Undset (q.v.) (1882-1949), whose *Jenny*, 1911, achieved great success, but has been surpassed by her historical trilogy, *Kristine Lavransdatter*, 1920-2.

Other 20th-cent. novelists are Cora Sandel (1880- ), Johan Falkberget (1879- ) who has described the life of the miners and mt-farmers in the Røros dist., and Sigurd Hoel (1890- ) who has also pub. many short stories. Of the 'New Norse' school a conspicuous figure was Jens Tvedt (1857-1935), who depicts the westland peasants' life in a wealth of dialect idiom. In contrast with the objective realism of Tvedt, as exemplified in *Madli un'Apalen* (*Madli under the Apple Tree*), 1900, is the subjective moodiness of Rasmus Løland (1861-1908), whose stories of child life have won high praise. Among *riksmaal* writers are Andros Haukland (1873- ), a prose-poet of the Arctic shores, and Hans Aanrud (1863-1953), who painted the folk life of the eastland with a quiet humour rare in Norwegian literature. Among the regional prose writers is Olaf Benneche (1883- ), an historical novelist. Perhaps the outstanding lyric poet of modern Norway is Arnulf Øverland (q.v.) (1889- ), whose fastidious sense of words is complemented by a strong passion for social justice; he was one of the earliest opponents of Nazism. Other modern lyrical poets are Nils Vogt (1864-1937), whose reflective poetry is unequalled in Norway, and Olaf Bull (1883-1933), whose poetry recalls that of Keats and Herman Wildenvey (1886- ), a *plein air* singer. Tore Orjasaeter (1886- ) is a lyric-epic poet of great sincerity. In the field of non-lyrical poetry must be mentioned Olaf Aukrust (1853-1929), a visionary *landsmaal* poet whose *Himmelvarden*, 1916, forms an impressive collection of religious-philosophical poems. With Olaf Duun (1876-1939) *landsmaal* came into its own; in his deep insight into the peasant character, Kristofer Uppdal (1878- ) portrays the labouring classes in the same medium. Niels Kjaer (1870-1924), one of Norway's few notable essayists, exhibits considerable diversity, and has also produced successful comedies. The most

conspicuous of modern Norwegian dramatists was the aristocratic individualist, Gunnar Heiberg (1857-1929), whose *Balkonen* (*The Balcony*), 1894, and *Kjerlighedens Tragedie* (*The Tragedy of Love*), 1904, are considered to be Norwegian classics. Of more recent drama the most important work has been by Helge Krog (1889- ), and by Nordhal Grieg (1902-43), who was shot down over Germany, Norway thereby losing a playwright and poet of great promise.

*Music.* No national music was written in Norway until the Romantic Movement began in 1840 with the 'national revival' in which Ludvig M. Lindeman (1812-87) collected many of the rural melodies which had survived through the Dan. period. Some of these tunes have connections with the *kjempeviser*, ballad material common to all Scandinavia; the *springdans* is the same as the Swedish *polka*. However, 2 Norwegian dances, the *gangar* and *halling*, have no parallel, and their rhythms have inspired many Norwegian composers. In vocal music, too, Lindeman found strange medieval survivals, reminiscent of old church chants, yet showing even older, simpler structure. The influence of this vocal music on the *kjempeviser* produced music of almost monumental character; in addition to these heavy melodies there are light, airy embellishments of the melody arising from the peasant love of the patterns of unison music. This, together with the surprising rhythm, created a unique Norwegian folk music. The most typical instruments were the *langleik* (plucked strings) and the *hardingfele* (Hardanger fiddle), the 8-stringed violin.

Ole Bull (1810-80), the violinist, was the first great name in Norwegian music, though he only wrote down 2 tunes. Halfdan Kjerulf (1815-68) was the founder of romanticism in Norway, and the work of Rikard Nordraak (1842-66) included many songs and the air of the national anthem.

The composer who is inseparable from Norwegian folk music is, of course, Edvard Grieg (q.v.) (1843-1907). Among his contemporaries were Johan Svendsen (1849-1911), restrained classical composer, Christian Sinding (1856-1941), disciple of Wagner, and the pianist and composer of songs Agathe Backer Grøndahl (1847-1907).

The founding of the Philharmonic Society in 1919 gave new scope for major orchestral works. With main emphasis on national themes Harald Saeverud (1897) and Klaus Egge (1908) have written works which have won international repute. Composer of atonal music is Fartein Valen (1887-1952), the most remarkable recent Norwegian composer.

*Architecture.* see SCANDINAVIAN ARCHITECTURE.

*Art.* Prehistoric pictures still exist in Norway, similar to the cave paintings of the Pyrenees: bold, naturalistic scenes of elk and reindeer hunting, of whaling and fishing. With the dawn of civilised society came the formation of a definite

national style in art, evolving from the rhythmical Celtic carving known all over Scandinavia and in Celtic Britain. This style was influenced not directly by Greece and Rome, as with the rest of Europe, but by all manner of local arts discovered (and plundered) by the Vikings (see VIKING ART). Then, as to-day, it was rich dramatic contrast which characterised Norwegian art. Even after the decline of Norwegian power in the Middle Ages, the stately Gothic style imported from the S. was superimposed upon this dramatic Norwegian element—literally so in the carving in the 'Stave' churches of Sognefjord. However, at the collapse of the Norwegian state, art styles became scattered and localised, developing and continuing in different ways in small areas. When independence returned, in the 19th cent., all these localised styles became the basis of a renewed stream of Norwegian style in art. The lively landscape work of I. C. Dahl was the first recognisably Norwegian art of the modern age; natural romanticism predominated, as in the work of Fearnley, Gude, and Tidemand, the great portrayers of peasant life.

It was not long before the tide of Fr. Impressionism swept in, strengthening the dramatic quality of colour and style even more. The 'most dramatic and explosive force' in all Norwegian art, produced by this period, is Edvard Munch (q.v.) (1863-1944), 'the Viking with the whole high-tensioned soul of our age.' A similar national synthesis of style is sought for in the world of sculpture by Gustav Vigeland (q.v.), who created the vast fountain project in Oslo's largest park, comprising scores of individual and group sculptures. For some years Vigeland practically monopolised Norwegian sculpture, and only since about 1920 has a new school appeared, under the teaching of Rasmussen, and including Seland, Pettersen, Vaa, and Dagfin Weronskiold. At the same time painting has produced many artists whose expressionistic use of colour is linked with the traditional dramatic style: Thorvald Erichsen's sunshine-filled works have peculiarly soft, rich, and tender colouring, while Ludvig Karsten fills his canvas with shattering colours and vibrating light, in contrast to the severe linear style and clear colouring of Harald Sohlberg; the emotional nature scenes of Nicolai Astrup contrast with the grim city paintings of A. C. Svarstad; some of the liveliest portraits have been produced by Henrik Lundh. Monumental artists, largely influenced by Matisse, include Sørensen, Krohg, and Revold (frescoes in Bergen Stock Exchange, 1918). In later decades the contrasting elements of national romanticism and international classicism seem to have succeeded in combining to form something typically Norwegian in painting style. Modern Norwegian painting strikes one as a daring and highly talented experiment in colour. The younger phalanx, among them Midelfart, Lie-Jørgensen, and Steen Johnsen, carry on the exploration of Norwegian landscape.

Especially the dist. of Telemark, with its richness of light effects, has attracted a wide range of artists. A very vigorous painter with a social consciousness is Reidar Aule, but perhaps the most outstanding of all are Kai Fjell and Arne Egeland, who both carry on the Munch tradition.

See also NORWAY AND DENMARK, GERMAN INVASION OF (1940).

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**Norway and Denmark, German Invasion of (1940).** In Mar. 1940 Koht, Norwegian Prime Minister, was protesting to Germany against the sinking of Norwegian ships, just as earlier he had protested to the Brit. Gov. against the brilliant Brit. naval feat of rescuing some 300 Brit. prisoners from the *Altmark* (see NAVAL OPERATIONS). Like other neutrals, Koht was living in an unreal world, which had no place in the totalitarian conception of international relations. Ger. U-boats were flagrantly ignoring Norwegian neutrality by sinking ships in their territorial

waters, among them, scores of Norwegian vessels. The Allies then also violated the neutrality by the laying of mines in Norwegian waters, which mine-laying also served the useful purpose of checking supplies of iron-ore coming down from Narvik through these waters to Ger. ports. The Norwegians protested against this violation of international law by Britain. Shortly afterwards, however, Germany invaded Norway in such circumstances of time and equipment as made it abundantly clear that the attack, far from being an unpremeditated retort to the Allies' minelaying, had been planned for months beforehand. Goebbels's broadcast on 9 April to the Ger. people that Norway and Denmark had been 'taken under the protection of the Reich to forestall allied occupation,' and identical proclamations to the armed forces and people of Denmark and Norway, were made by the respective Ger. commanders of the invading forces in those countries. At dawn on that day strong mechanised Ger. units crossed the Schleswig frontier near Flensburg and Tønder and proceeded to the rapid occupation of the whole country, which was accomplished within a few hours without encountering any organised resistance. Simultaneously Ger. troops were landed from warships and transports at Copenhagen, Kōrsør, and other places. The Ger. invasion was accepted by the Dan. Gov. under protest and they and the king called upon the people 'to adopt a calm and controlled conduct,' declaring it to be their duty to refrain from resistance. The Norwegians, on the other hand, refused to accept the Ger. ultimatum and their gov. ordered a general mobilisation. But already the Germans had landed troops at Bergen, Stavanger, Trondheim, Egersund, Narvik, and other places and all these troops were soon in their hands. Troops were also landed in Oslo Fjord. The Norwegian Parliament and King Haakon and the royal family left Oslo for the N., aided by the failure of the naval invasion of the cap. In the later afternoon Oslo was occupied by the Germans as a result of surprise airborne landings. Meanwhile Narvik had been taken after resistance by 2 old Norwegian defence vessels had been overcome by 10 Ger. destroyers. Brit. naval and air forces promptly counter-attacked and a number of Ger. ships, including transports, were sunk (see NAVAL OPERATIONS). Brit. troops were landed at sev. points on the Norwegian coast and more Ger. transports were sunk, while the Ger. pocket battleship *Admiral Scheer* was hit by a torpedo. An allied force under Maj-Gen. Carton de Wiart, V.C., effected a landing at Namsos and advanced in the hope of capturing the Trondheim-Namsos railway line. Ger. landings were, however, made in Trondheim Fjord, and heavy Ger. counter-attacks were delivered by these troops in the Trondheim area (23 April), and later the Germans captured the important position of Stenkjer, while the Allies were forced to withdraw from positions near Lillehammer, it being evident that the

Germans would make every effort to establish contact between their forces N. of Oslo and those in the Trondheim area by a thrust up the Osterdal valley. Early in May Chamberlain announced that the Brit. troops in S. Norway had been withdrawn from Aandalnes, the Brit. Gov. having decided that they must abandon any idea of taking Trondheim from the S. Brit. losses, however, were slight on land, but on the sea, during the 3 weeks that had now elapsed, the R.N. had lost 4 destroyers, 3 submarines, 1 sloop, and 5 trawlers. The Ger. losses at sea were, however, so heavy that they permitted of an important redistribution of the main allied fleets. In the following month the Allies withdrew from N. Norway. The loss of Narvik was important both from a material and psychological standpoint, for it was from this port that the much-needed Swedish iron-ore was shipped for Germany, though before abandoning it the Brit. forces had prevented the use of the port for some time; and furthermore, the abandonment of the whole Norwegian adventure, superadded to the fact that the Allies had been forestalled by the Germans, involved much damage to allied prestige. This failure led to a most acrimonious debate in the House of Commons with the result that Chamberlain resigned and was succeeded by Churchill. It is curious that the Brit. Gov. did not foresee the Ger. attack on Norway. Even at the eleventh hour Britain did not realise that the dispatch of strong Ger. naval units to the N. waters of Norway was a decoy to draw the Brit. fleet away from the Skagerrak where it could have destroyed most of the Ger. transports and accompanying vessels and then sailed N. to destroy the rest of the Ger. naval units. The result of the Ger. success was of course to place the entire Norwegian coast in their hands as a base for future operations against the Brit. Isles. See H. K. Lehmkuhl, *The Invasion of Norway* (pub. by authority of the Norwegian Gov.), 1940, and *Hüller attacks Norway*, 1943, and T. K. Derry, *The Campaign in Norway*, 1952.

**Norwegian Architecture**, see SCANDINAVIAN ARCHITECTURE.

**Norwegian Sea**, name given to the part of the N. Atlantic Ocean which stretches between Norway and Iceland, and between the Arctic Ocean and about lat. 64° N. It is connected with the Arctic in the far N. between Svalbard (Spitzbergen) and Greenland by a wide, deep opening. An extensive seal and whale fishery is carried on, especially off the N. and E. coasts of Jan Mayen Is. Area 100,000 sq. m. Mean depth 870 fathoms.

**Nor'-wester**, prevailing wind of S. Is., New Zealand. It causes a heavy rainfall on the W. slopes of the S. Alps, and becomes a warm and dry föhn wind over the plains to the E. of the mts. The term is also used for tornados (q.v.) in India.

**Norwich**, Alfred Duff Cooper, 1st Viscount (1890-1954), statesman, diplomat, and author; educ. at Eton and New College, Oxford. He served with the Grenadier Guards in the First World War.

From 1924 to 1929 he was Unionist M.P. for Oldham and was financial secretary at the War Office, 1928-9. In 1931 he was elected M.P. for St George's, Hanover Square, and returned to his former position at the War Office, 1931-4. He held the same position at the Treasury, 1934-1935; secretary of state for war, 1935-7; first lord of the admiralty, 1937-8, resigning after the Munich Pact; minister of information, 1940-1; Chancellor of the Duchy of Lancaster, 1941-3. N. was the representative of the Brit. Gov. with the Fr. Committee of National Liberation, 1943-4, and an outstandingly successful ambas. to France, 1944-7. Author of *Talleyrand*, 1932, *Haig*, 1935-6, *The Second World War*, 1939, *David*, 1943, *Operation Heartbreak*, 1950, and his autobiography, *Old Men Forget*, 1953. N. married (1919) Lady Diana Manners, youngest daughter of the 8th Duke of Rutland.

**Norwich**, city and co. bor. in the centre of the E. portion of the co. of Norfolk, England, 20 m. from the coast, and situated in the valley of the Wensum, about 115 m. NE. by N. of London. Fragments of the anct walls, which were 4 m. in circuit, remain. On a mound, which existed before 1100, with pleasure gardens occupying the moat, stands the famous Norman castle. Built soon after the Conquest to dominate E. Anglia, it was destroyed in the Earl of Norfolk's rebellion against William I, and the present building, an almost cubic block, is attributed to Wm Fitz-Osbern (c. 1120). It suffered capture by Flemings in 1174, and by Fr. troops in the reign of King John, but its military importance declined with the coming of artillery and the gradual settlement of the country. It was given to the co. by George III and was used as a Jail until 1887, when the prison on Mousehold was built. Refaced in 1834-9, the keep was opened in 1894 as the Norwich Castle Museum, where are to be found important collections of antiquities, raptorial birds, and flint implements. The art galleries, enlarged in 1951, contain the finest collection in the country of the works of John Crome, John Sell Cotman, and other artists of the Norwich School of landscape painting. Norwich Cathedral dates from 1096.

There are over 30 city churches, mostly built of flint in Late Decorated or Perpendicular style. The largest, St Peter Mancroft, dating from 1430 to 1455, is one of the finest par. churches in England; its tower is 102 ft. and the church contains the tomb of Sir Thomas Browne, whose statue stands on the Haymarket near by. St Andrew's Church, rebuilt 1506, contains elaborate tombs of the Suckling family and a memorial tablet to 'Abraham Lincoln' of great interest to Americans. The 15th-cent. church of St Peter Hungate is now an eccles. museum. Air raids cost the city sev. churches, including that of St Julian, associated with Julian of Norwich (q.v.), which has since been rebuilt. The grammar school, originally a charnel-house chapel of c. 1316, was converted into a school in the reign of Edward

VI. Lord Nelson, George Borrow, and Rajah Brooke of Sarawak were scholars there. The guildhall, a quaint flint building, dates from 1407 to 1413. The city hall, opened in 1938 by King George VI and Queen Elizabeth, is a good example of modern civic architecture. Its clock tower is 185 ft high. The garden of remembrance was designed by Lutyens. The 15th-cent. St Andrew's Hall was at one time the nave of the church of the Dominicans or Blackfriars. There is a magnificent Georgian Assembly House, restored in 1950 as an arts centre. Other notable features are the 15th-cent. Maid's Head Hotel; the Stranger's Hall, a 16th-cent. merchant's house, now a folk museum; Suckling House, a 16th-cent. banqueting hall; Erpingham Gate, built by Sir Thomas Erpingham, 1420; Ethelbert Gate, commemorating a riot between monks and citizens, 1272; the Bridewell, built 1370, now a museum of local industries; Pull's Ferry, anct water-gate; and the 13th-cent. Bishop's Bridge, one of the oldest bridges in England. The chief parks are Eaton Park and Earlham Park. Other parks and open spaces include Mousehold Heath, Chapel-field Garden (the central public garden of Norwich), Waterloo Park, and the quaint cobbled and gabled 'Tombland,' deriving its name from the *loom* or open land which was the market place of the original A.-S. settlement of Norwich (c. AD 600-700). Theatres include the Maddermarket, home of the Norwich Players, and the Theatre Royal.

During the Second World War Norwich was heavily damaged: 340 persons were killed, 1100 injured, and nearly 5000 houses and historical monuments were damaged or destroyed. Norwich is administered by a lord mayor, 16 aldermen, and 48 councillors, and returns 2 members to Parliament.

The staple industry of Norwich, employing over 10,000 hands, is that of higher grade shoe manuf. Other large industries include those of mustard, starch, cereals, confectionery, electrical and structural engineering, printing, insurance, brewing, silk and silk dyeing. For cents. Norwich has been the leading market in E. Anglia. There are large cattle, provision, and fish markets, and the provision market is of very anct origin. Pop. 121,226. There is a long hist. of Norwich in the Norfolk Directory, c. 1862. See Hudson and Tingey, *The Records of the City of Norwich*, 1906; Ian C. Hannah, *The Heart of East Anglia*, 1910; W. Rye, *Norwich Castle*, 1921; Thomas Wake, *Norwich, City of a Thousand Years*, 1945; A. Kent, *Norwich Inheritance* (photographs), 1948; R. H. Mottram, *If Stones Could Speak*, 1953.

Norwich, city of Connecticut, U.S.A., on the R. Thames, 40 m. SE. of Hartford. It is a port of entry and a flourishing industrial centre, and manufs. thermos flasks, textiles, aircraft components, paper products, leather goods and shoes, chemicals, clothing, bedding, metal products, paint, and cutlery. It was settled by colonists in 1659, when 9 sq. m. were

bought from Uncas, a Mohegan Indian chief. Pop. 23,429.

**Norwich Cathedral.** The original church was planned and begun (1096) by Herbert de Losinga, first bishop of N., and completed by his successor. De Losinga also built a Benedictine monastery for 60 monks under their rulers; this was closed (1538) and most of the buildings have disappeared. The church, however, remained as N. C., and retains the appearance of a typical Norman building. Much damage has been caused to N. C. at various times by storms and fires, and later rebuilding has taken place in the Early Eng., Decorated, and Perpendicular styles. Stone vaulting with richly carved bosses, erected c. 1472-1536, now replaces the flat, wooden ceilings in the prin. parts of the building. The carved wooden stalls in the choir date from 1416 to 1425. At the E. end is a chapel built on the site of 2 earlier chapels as a memorial to men and women of the co. who fell in the war of 1914-18; it is also the chapel of the Royal Norfolk Regiment. The bishop's anct throne, standing E. of the high altar and facing W., is the only seat of its kind in N. Europe which is still in use. The 14th-cent. cloisters took 130 years to rebuild. The glorious spire (rebuilt 15th cent.) is 313 ft high. Edith Cavell is buried outside the church near the E. end, in the part known as Life's Green.

**Norwood, Sir Cyril** (1875-1956), Eng. educationist, son of a clergyman, was educ. at Merchant Taylors' and at St John's College, Oxford, of which collegio he was president from 1934 to 1946. He secured the first place in the civil service examination for first-class clerks and for 2 years served in the Admiralty. At 26 he left the service to become a master at Leeds Grammar School. In 1906 he was elected headmaster of Bristol Grammar School and 10 years later he went to Marlborough College, where he introduced some rather drastic reforms (1916-25). From 1926 to 1934 he was headmaster of Harrow. He was knighted in 1938. He was chairman of the Board of Education committee asked to report on the curriculum and examinations in secondary schools (1941). The findings of this committee, which gave support to the tri-partite system, were very influential and are contained in a report widely known as the *Norwood Report*.

**Norwood, Gilbert** (1880-1955), Eng. classical scholar. He was prof. of Greek at Cardiff from 1908 to 1926 and then went to Toronto Univ. as prof. of classics. His pubs. include *Greek Tragedy*, 1920, *Writers of Greece*, 1925, *Greek Comedy*, 1931, and *Pindar*, 1945.

**Norwood, Richard** (1590?-1675), Eng. mathematician. In 1616 he was sent to the Bermudas to survey the newly settled is., and was accused of having reserved for himself some of the best land there; he resided there during the civil war as a teacher of mathematics. He ascertained the lat. at a position near the Tower of London and also of a place in the centre of York. He pub. a map of Bermudas in

1822, *The Gunner, shewing the whole Practice of Artillerie*, 1828, *Trigonometrie, Or the Doctrine of Triangles*, 1831, *The Seamans Practice*, 1837, and *The Doctrine of Triangles*, 1867.

**Norwood:** 1. Suburban dist. of S. London, a mile SW. of Dulwich. It consists of Upper, Lower, and S. Norwood, and forms the S. portion of the bor. of Lambeth. Pop. 85,600.

2. Suburb of Adelaide (q.v.), S. Australia, lying 3 m. NE. of the city; pop. 16,000.

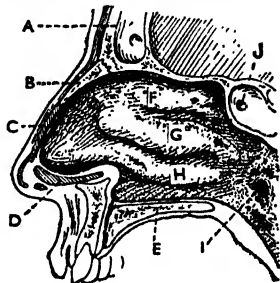
3. City of Ohio, U.S.A., forming a NE. suburb of Cincinnati. It manufs. playing cards, office equipment, aircraft parts, electrical goods, etc. Pop. 35,000.

4. Tn. of Massachusetts, U.S.A., in Norfolk co., 14 m. SSW. of Boston. Tanning is carried on an there are printing and publishing plants, foundries, and knitting factories. Pop. 16,636.

**Nose**, organ of smell. It consists of an external portion and an internal part divided into 2 nasal cavities. The outer N. has the shape of a triangular pyramid. The bony structure of the N. consists of the short nasal bone which is connected with the forehead by a bridge. Besides this bone, the N. is supported by cartilages, of which the 5 chief are the cartilage of the septum and the upper and lower lateral cartilages. The cartilage of the septum forms the supporting part of the vertical partition which separates the right and left nasal cavities. The lower part of the septum is not formed by the cartilage of the septum, but is freely movable, and is on this account called the *septum mobile nasi*. The upper lateral cartilage is triangular in shape, and serves as a continuation of the nasal bone. It is joined at its lower edge on each side by fibrous tissue to the lower lateral cartilage. This consists of 2 plates; the outer one is oval and communicates with the inner one by a rounded piece which forms the point of the N. The lowest part of the N., or 'wing', is formed of skin externally and internally. The orifices or nostrils are guarded by small hairs, or vibrissae, which serve to protect the nasal cavities from dust, small insects, etc. Above the aperture in each nostril is a slightly expanded cavity, the *vestibule*, which is prolonged towards the tip as a pouch, or *ventricle*. Above the vestibule the nasal passage, or *fossa*, is divided into 2 parts, the upper or *olfactory*, and the lower or *respiratory*, portion. The fossae are divided into 3 passages or *meatuses* by 3 *turbinated*, or scroll-like, bones. The meatuses communicate with the ethmoidal, sphenoidal, and frontal cells.

The olfactory region is lined with mucous membrane, yellowish in colour, and containing olfactory glands, or glands of Bowman, embedded in it. In the respiratory region the mucous membrane is covered by columnar, ciliated epithelium, and contains many cells secreting a watery fluid. The N. is supplied by branches of the facial nerve, the ophthalmic, and others for the conveyance of motor impulses and of ordinary tactile sensations. The sense of smell is conveyed

by olfactory nerves arising from the olfactory bulb and distributed over the mucous membrane of the olfactory region. Here they are connected with rod-like cells; these cells pass between the columnar epithelium to the surface, where a delicate filament serves as a free end; at the other end of each cell the filament becomes continuous with an olfactory nerve filament. It is not definitely known whether the external stimulus which gives rise to the sensation of smell is physical or chemical in its nature. In 1948 Prof. W. R. Miles of Yale Univ., after experiments with insects, put forward the theory that the sensation is due to infra-red radiations which the nose is able to receive. The substance exciting the smell must be in a finely divided state,



SECTION OF THE NASAL REGION  
SHOWING THE RIGHT NASAL  
CAVITY

A, frontal bone; B, nasal bone; C,D, nasal cartilages; E, nasal palate; F, superior ethmoidal concha; G, inferior ethmoidal concha; H, inferior turbinal (maxillary concha); I, opening of Eustachian tube; J, opening to sphenoidal sinus.

and is usually a vapour or gas. The free ends of the olfactory filaments are usually covered with a thin layer of fluid. If the fluid is too thick, as in catarrh, or if it is replaced by a dry crust, the efficiency of the olfactory organ is diminished or temporarily destroyed. The exciting substance becomes dissolved in the watery fluid, and so affects the cell filaments. In order that solution may be effected readily, a certain amount of pressure is necessary; that is, the air containing the substance must be driven with some force against the membrane by sniffing. The organ of smell is probably not so delicately differentiated in man as in some of the lower animals. The sense is quickly fatigued, so that a delicate odour is sometimes not perceived after the initial experience; most persons also find it difficult to discriminate in a mixture of smells, and probably only the predominating odours in a host of smells are perceptible to man, although the lower animals might be able to discern many.

**Diseases, etc.** The N. may be fractured by direct violence, and if adequate treatment is not resorted to, a displacement of

the septum may result, leading to nasal obstruction and possible complications. *Acne rosacea* is a skin affection characterised by congestion of the capillaries of the outer N. and later by hypertrophy of the sebaceous follicles. The N. has then a swollen appearance, and the course of the dilated capillaries can be plainly seen. It occurs in dyspeptics, alcohol- and tea-drinkers, and is known as 'brandy nose' or 'whisky nose,' though the cause may not be the use of alcohol. Lupus (see TUBERCULOSIS) and erysipelas (q.v.) may affect the N. Rhinitis is a very common complaint. It involves inflammation of the mucous membrane of the N.; its acute form is coryza or cold in the head. Rhinitis is an allergic manifestation in some cases, the allergens being certain dusts or pollens, as in hay fever. Chronic rhinitis is due to repeated attacks of the acute form, and produces in the early stages hypertrophy of the mucous membrane, and in the later stages atrophy of the mucous membrane, together with the formation of dry crusts, or scabs. The nasal mucous membrane is sometimes the site of diphtheritic infection (see DIPHTHERIA). Epistaxis is bleeding from the N. The cause may be a high arterial pressure due to one of a variety of conditions, and in many cases is itself a remedial effort of the organism. Where the bleeding continues the patient should rest quietly on the back. If the haemorrhage continues the N. must be plugged. Polypi, or tumours, may be formed on the mucous membrane. A soft mucous polypus can easily be removed and does not usually recur, but fibrous polypi have a tendency towards malignancy. Sinusitis, or inflammation of the chambers of the skull which open from the N., is of common occurrence.

**Nosean**, or **Noselite**, aluminosilicate and sulphate of sodium ( $3\text{Na}_2\text{Si}_2\text{Al}_2\text{O}_7 \cdot \text{Na}_2\text{SO}_4$ ) closely allied to hatynite (q.v.) and the artificial ultramarines. It occurs in cubic crystals, usually dodecahedrons, of various colours and sometimes opaque. Found in the Lancher See (Rhine-land), the Alban Hills (Rome), Kaiserstuhl (Baden) and in sev. of the hatynite localities.

**Noske**, Gustav (1868-1946), Ger. politician, b. Brandenburg, served an apprenticeship as a carpenter, but soon took up political journalism, and in 1906 entered the Reichstag. In the First World War, which split the Ger. Socialist party, N. sided with the majority Socialists under Scheidemann and Ebert. He was appointed minister of defence in the Coalition Gov. of the Weimar Rep., 1919, but his firm handling of revolutionary disorders caused criticism which led to his resignation. Later he became president of the prov. of Hanover. N. was arrested by the Nazis after the plot against Hitler in July 1944 and sent to a concentration camp, but later moved to the Moabit prison where he was found when the war ended.

**Nosology** (Gk *nosos*, disease; *logos*, science), that branch of medicine concerned with the distribution and arrangement of diseases into classes, orders, etc. The term is also applied to collection of evidence as to whether a particular

condition should be regarded as a special disease.

**Nossairians**, or **Alawis**, see ANSARS.

**Nossi-Bé**, is. 8 m. from the NW. coast of Madagascar, belonging to France. It is 14 m. long by 10 m. broad with an area of 130 sq. m. It is volcanic and mountainous. Rice, maize, manioc, bananas, coffee, and sugar are grown. Cap. Hellville. Pop. 12,000.

**Nostalgia** (Gk *nostos*, return home; *algos*, pain), home-sickness. It is sometimes an early phase of melancholia, but is usually only a transient emotional manifestation. It varies in intensity from a sentimental inclination to think fondly of the homeland to an uncontrollable desire to return and a settled dislike of one's present surroundings. In its more severe form it is more likely to occur in the insecure, over-dependent type of personality that finds it difficult to achieve a fully adult adjustment to environment.

**Nostradamus**, or **Michel de Notre-Dame** (1503-66), Fr. astrologer, of Jewish extraction, b. St Rémy, Provence. For many years he practised as a physician, and gained high reputation for his skill in stemming the tide of the great plagues of Lyons. Catherine de' Medici brought him to her court, and he was physician to Charles IX. His *Centuries*, prophecies in rhymed quatrains, was pub. in 1555, and was condemned by the Holy See. See lives by E. Jaubert, 1656, and E. Bareste, 1840; also C. Wöllner, *Das Mysterium des Nostradamus*, 1926.

**Nota**, **Alberto** (1775-1847). It. comedy writer in the tradition of Goldoni, b. Turin. He was greatly influenced by Molière, but he followed his model too closely to give his own individuality scope and freedom. His best work is perhaps *La Lusignhiera*. Collected eds. of his plays were pub. at Florence in 1827 and at Turin in 1837 and 1842.

**Notables**, **The**, advisory assemblies of notable personages summoned by the kings of France in times of stress. These assemblies had no constitutional authority and their transactions were of a purely private and confidential nature. Richelieu consulted this body in preference to the states-general. The best known was that convoked by Louis XVI in 1787 at the instigation of Colonne; it was called in order that the privileged classes might be consulted on, and give their consent to, a more equitable system of tax collecting. Louis XVI again summoned the N. in 1788 when its members' reactionary attitude helped to increase popular ill-feeling and so probably encouraged the outbreak of the revolution.

**Notary Public**. The office of N. P. is of great antiquity, and its origin is to be traced to the professional writers or scribes who made drafts of public and private instruments. According to Brooke (*Treatise on Notaries*, 1901) the name was applied amongst the Jews to the royal secretaries who wrote the letters and edicts of the king, kept the register of his troops, and attended to his revenue and expenditure; to scribes who copied and interpreted sacred writings; and to officials



who wrote and prepared legal documents. The same authority finds analogous officials in ant. Syracuse, Egypt, Greece, and Rome. The term *notary* itself is derived from Latin, *notae*, meaning the system of stenography in vogue among the early Rom. scribes, though later it appears to have been applied to the clerks or registrars attached to the prov. and municipal magistrates and officials of the emperor's privy council, while those who prepared private deeds and documents were specifically known as *tabelliones* from *tabellio*, the thin waxed tablets used in drafting. There is no European nation without its N.s P., though their duties differ considerably in different countries. In England the duties of a N. P. are very circumscribed, and in status he is far below, for example, the N. P. of France. The Eng. notary's chief duties are to note and protest bills of exchange, to authenticate copies of private documents and deeds, to draft and attest instruments like powers of attorney about to be sent abroad, and receive affidavits of mariners, and administer oaths. A great many of the functions of a notary are, however, in England performed by solicitors, e.g. the preparation of wills and contracts, and hence it is that this official's duties are so commonly associated with protesting bills of exchange on dishonour. The utility of 'a notarial act' (i.e. the act of authenticating or certifying a document or entry by a written instrument under the signature and seal of a N. P., or an instrument attestation, or certificate made or signed by a N. P.) is that it is by the custom of all merchants accepted as unimpeachable evidence of the legal validity of the transaction recorded by it, notwithstanding that such transaction may have no validity in the country where it actually took place. The powers of a N. P. in America are wider; he may take depositions and do other acts relating to the recording of testimony, and take proofs of debts in bankruptcy. In England N.s P., who have always been civil and canon law officials, are appointed by the Archbishop of Canterbury. In America they are appointed by the state-governor, and with the advice of either the council or the senate of the state.

**Notation** (from Lat. *notare*, to mark). In music, the art of writing music in notes, i.e. representing musical sounds and their various modifications, by notes, signs, etc. Between 990 and 1050 N. was much improved by Guido of Arezzo, who founded our present system. The ant. Gk system was phonetic; also the modern Arabian system, the old tablatures, and Tonic Sol-fa methods of to-day. Sound, key distance, and scale relationship are their bases. The diastematic system of 'N. by intervals' comprised the neums (or neumes), representing groups of notes, and first came into use about the 7th cent. The pitch of sound is now expressed by the positions of notes and the presence of clofs on sets of 5 lines, called 'staves' (which began as a single line and afterwards had companion lines added to it; plainsong still uses 4 lines with the old

square notes). Their relative duration is defined by variously shaped notes. Key and rhythm are indicated by signatures. Present N. is somewhat inadequate to the demands of modern music, because atonal writing involves frequent accidentals. Various new systems have been suggested, but the obstacle to reform is the vast mass of printed music.

In mathematics N. is the elaborate system of signs, symbols, numbers, and letters which has been gradually evolved to meet the needs of discovery. There is no accepted world system of N., but there is enough uniformity to enable mathematicians in different countries to understand each other. N. is of fundamental importance to mathematics, as language is to philosophy, and the progress made would have been impossible by the use of words alone. For a full treatment see F. Cajori, *A History of Mathematical Notation*, 1928.

Scales of N. are the various systems of writing numbers, the common and only one in practical use to-day being the denary scale or scale of ten, ten being the radix. On this scale 12 means  $1 \times 10 + 2$ . There can be binary, tertiary, etc., scales with radices of 2, 3, etc. On the nonary scale, for example, where the radix is 9, 12 means  $1 \times 9 + 2$ , which would be written 11 in the ordinary scale, and 346 represents  $3 \times 9^2 + 4 \times 9 + 6$ , etc. To transform 356 from the denary to the duodenary scale we may proceed as follows:

$$\begin{aligned} 356 &= 300 + 50 + 6 \\ &= (2 \times 12^2 + 1 \times 12) + (4 \times 12 + 2) + 6 \\ &= 2 \times 12^2 + 5 \times 12 + 8 \\ &= 258, \text{ omitting the radix symbols.} \end{aligned}$$

Each branch of science has its own particular system of N., based on mathematical N. and adapted for special needs. See CHEMISTRY; PHYSICS; etc. See also DECIMAL SYSTEM; DUODENIMALS; SIGN; SYMBOLS.

**Notched-bar Test**, method of testing relatively ductile materials. A notched metal bar is struck by a heavy pendulum, the energy required to break the bar being expressed in foot-pounds.

**Notes, Bank, see BANKS AND BANKING.**  
**'Notes and Queries'**, monthly paper of quaint or unknown or little-known facts, phrases, archaisms, and bibliographies of interest to the literary world, estab. in 1849 by the antiquary, Wm John Thorne, with the object of providing a weekly paper in which literary men could answer one another's questions. Its motto was, until 1923, Capt. Cuttle's, 'When found make a note of.' In 1920 it was bought by *The Times*, and in 1939 by the Oxford Univ. Press.

**Notestein**, Wallace (1878- ), Amer. historian, educ. at Wooster and Yale Univs. He was prof. of Eng. hist. at Cornell Univ., 1920-8, and from 1928-47 was prof. of Eng. hist. at Yale. He was George Eastman Visiting Prof. at Oxford, 1949-50. His studies on the hist. of the House of Commons have become indispensable standard works and include an ed. of *D'Ewes Journal of the Long Parliament*, 1923, and *The Winning of the*

*Initiative by the House of Commons, 1924.* Other pubs. include *The English People on the Eve of Colonisation, 1954.*

**Nothofagus**, genus of deciduous and evergreen trees of the Antipodes and S. America, family *Fagaceae*, about 15 species; *N. obliqua*, Roblé Beech, *N. procer*, *N. dombeyi*, and *N. fusca* are hardy for mild localities in Britain.

**Notholaena**, family *Polypodiaceae*, a genus of delicate ferns, with under-surface of fronds clothed with fine powder, scales or tomentum, known as Gold and Silver Ferns; grown in warm greenhouses; *N. trichomanoides* being unqualified.

**Nothoscordum**, genus of bulbous plants (family *Liliaceae*) bearing umbels of white, yellow, lilac, rose, or purple flowers. *N. inodorum* and *striatum* are hardy; others are grown in cool greenhouses.

**Nothotherium**, see *SLOTH*.

**Notice, Equitable and Judicial: Equitable.** It is a principle of equity (q.v.) that an equitable as distinct from a legal (i.e. common law) interest in property is in no way binding upon the person who obtains the legal interest, unless he ought in conscience to respect the equitable interest, and in general his conscience can only be affected by *notice*, actual or constructive, of the existence of the equitable interest; e.g. A, the owner of an estate, creates an equitable mortgage of it to B; then without disclosing such mortgage, A makes another equitable mortgage of it to C. C is ordinarily postponed to B in the matter of repayment of their loans because later in point of time; but if, *assuming that at the time he took his mortgage he had no notice of the existence of the mortgage to B*, he subsequently induces A to convey to him the legal estate, whether by way of mortgage or otherwise, he can ignore B's mortgage altogether. By constructive notice is meant either knowledge of a fact from which the existence of an equitable interest ought to have been inferred, or the possibility of discovering its existence by the usual method of investigating title.

**Judicial.** A court of law is said to take *judicial notice* of a fact when it accepts it in evidence without proof. All judges take judicial notice of, *inter alia*: (1) all Acts of Parliament, public or private, and all unwritten laws and legal principles acted upon by the courts of Great Britain; (2) all general customs decided by a superior court of law of equity to have the force of law; (3) the course of proceeding, and all rules of practice, of the Supreme Court; (4) the general course of proceeding and privileges of Parliament; (5) the ordinary course of nature, and natural and artificial divs. of time; (6) the ordinary meaning of Eng. words; (7) the existence of every state and sovereign recognised by Great Britain; (8) the signatures of high court judges; and (9) all matters which they are directed by statute to notice. See Taylor, *On Evidence*, and Stephen, *Digest of Evidence*.

**Notification of Diseases.** The following diseases are notifiable throughout England and Wales under the Public Health Act, 1936: smallpox, cholera, diphtheria, membranous croup, erysipelas, scarlatina

or scarlet fever, fevers known by the name typhus, typhoid, enteric or relapsing. In London the fever known as 'continued' is notifiable under the Public Health (London) Act, 1936. The following diseases are also compulsorily notifiable by reason of regulations made by the minister of health: plague, acute poliomyelitis (including polioencephalitis), acute encephalitis, meningococcal infection, malaria, dysentery (including amoebic and bacillary dysentery), acute primary pneumonia, acute influenzal pneumonia, ophthalmia neonatorum, puerperal pyrexia, measles and whooping cough, and leprosy. Tuberculosis is a notifiable disease under the Public Health (Tuberculosis) Regulations, 1930. Food poisoning is notifiable under the Food and Drugs Act, 1938. In certain dists. the following are notifiable under local regulations made by, or local orders approved by, the Local Gov. Board or minister of health: anthrax, chicken-pox, epidemic diarrhoea, summer diarrhoea, glanders, hydrophobia, pemphigus neonatorum, acute rheumatism, scabies, infective enteritis, and zymotic diarrhoea. In one particular area only catarrhal jaundice, acute inflammation of the liver, toxic jaundice, and infective jaundice are notifiable under the Jaundice Regulations, 1943.

In Scotland the following diseases are notifiable: acute poliomyelitis (including acute polioencephalitis), acute influenzal pneumonia, cerebrospinal fever, cholera, continuing fever or puerperal fever, diphtheria, dysentery, encephalitis lethargica, erysipelas, infective jaundice, leprosy, malaria, membranous croup, ophthalmia neonatorum, plague, puerperal pyrexia, relapsing fever, scarlet fever, smallpox, tuberculosis, typhoid or enteric fever, typhus fever, and whooping cough.

Under the Factories Acts of 1937 and 1948 and the Lead Paint (Protection against Poisoning) Act, 1926, every medical practitioner attending on or called in to visit a patient whom he believes to be suffering from any of the following diseases, contracted in any factory or other premises to which the provisions of the Factories Acts as to notification of industrial diseases apply, must notify the case forthwith to the chief inspector of factories, Ministry of Labour and National Service: lead poisoning, phosphorus poisoning, manganese poisoning, arsenical poisoning, mercurial poisoning, carbon bisulphide poisoning, aniline poisoning, chronic benzene poisoning, compressed air illness, anthrax, toxic jaundice, toxic anaemia, and epitheliomatous ulceration or chrome ulceration.

**Noto**, tn in Sicily (q.v.), 17 m. SW. of Syracuse (q.v.), and 2 m. from the coast. It dates from 1703. The previous tn, 5 m. to the N., occupied the site of the Rom. *Netum* and was destroyed in an earthquake. There is a baroque cathedral and other fine churches, and in the vicinity are Christian catacombs, Gk cemeteries, and prehistoric tombs. There is a trade in agric. produce, wine, and olive oil. Pop. 30,000.

**Notochord**, supporting rod of closely

packed cells characteristic of those animals which comprise the phylum *Chordata*. The N. runs lengthwise from anterior to posterior ends, and is situated immediately ventral to the spinal cord. The members of the sub-phylum *Acrania* lack a skull and backbone; they comprise (1) the Cephalo-chordata, such as *Amphioxus* (q.v.) which are named from the extension of the N. to the extreme tip of the 'head,' (2) the Tunicates or Sea Squirrels, which possess a N. in the larval stage, though it is lost in the adult, (3) the Hemichordata, e.g. *Balanoglossus*, worm-like animals with the N. restricted to the region of the proboscis. In the remaining sub-phylum, *Cranialia* or *Vertebrata* (fishes, amphibians, reptiles, birds, and mammals), a skull with a cranium enclosing the brain is formed, and the N. becomes surrounded by the vertebrae of the backbone. In some lower forms of vertebrates, such as the lamprey, the N. persists in the adult, but in most it can be recognised only in the embryo, and is soon obliterated by the backbone which develops around it.

**Notornis**, see TAKAHE.

**Nôtre, André Le**, see LE NÔTRE.

**Notre Dame Bay** lies between Fogo Is. and Cape St John, on the NE. coast of Newfoundland in the Bay of Exploits; at the E. end is a large archipelago.

**Notre Dame Convent**, Mt Pleasant, Liverpool, Catholic secondary school for girls and training college for teachers, staffed by the Sisters of Notre Dame.

**Notre-Dame de Paris** (Our Lady of Paris), the great cathedral of Paris, is situated at the SE. end of the Ile-de-la-Cité. The first stone of the cathedral was laid by Pope Alexander III and Louis VII in 1163, on the site of an ancient Merovingian cathedral. The general structure was completed by 1245. After undergoing many depredations in the 18th cent., Notre-Dame was restored by Viollet-le-Duc (q.v.) in 1845-64. It is a magnificent example of the first two periods of Gothic, the great rose-window, the apse, the towers, and the doors being especially noteworthy. See M. Aubert, *Notre-Dame de Paris*, 1928.

**Notting Hill**, residential dist. of London, near the W. end of Hyde Park, 4 m. W. of St Paul's, part of the bor. of Kensington.

**Nottingham, Earls of**, see FINCH, HENAGE, and HOWARD OF EFFINGHAM.

**Nottingham**, city and co. bor. of England, cap. of Notts, on the Trent, 125 m. NNW. of London by rail, and an important rail centre. The R. Trent is navigable to the sea, and gives access to Newark, Gainsborough, and the Humber ports. At the Nottingham end of the navigation there are adequate basins, warehouses, and transport sheds.

The Rom. station of *Marquidunum* at E. Bridgford was an important site on the Rom. Fosse Way between Leicester and Lincoln. A fort of Claudian age has been very thoroughly excavated in recent years. The A.-S. named the tn *Snotingham* and occupied it for a long period from about the 6th cent. AD. N. was one of the 'Five Burghs' occupied by the Danes.

William the Conqueror occupied the tn in 1086. In 1589 the Rev. Wm Lee invented the first stocking-frame here. Charles I raised his standard here in 1642 and the next year the tn and castle were taken by the Parliamentarians. At N. Richard Arkwright first erected his spinning-frames and Hargreaves his spinning-jenny. Serious riots, occasioned by the introduction of machinery, took place in 1811-12 and 1816-17. Sherwood Forest (the legendary home of Robin Hood) has long been shorn of its mighty grandeur, but remains of it still exist in the Dukeries (q.v.). Wm Booth, founder of the Salvation Army (q.v.), was b. in N.

The prin. public buildings are the Council House, opened in 1929 by the Prince of Wales, the Guildhall, and N. Castle, originally built on Castle Rock by William the Conqueror, dismantled during the Protectorate, restored in 1878, and now the Castle Museum and Art Gallery. The collections include examples of N. alabaster carving, a local industry of the 14th and 15th cents. Other important buildings are the churches of St Mary (15th cent.), St Peter (partly 12th and partly 15th cent.), St Nicholas (1678), and the Rom. Catholic cathedral of St Barnabas (designed by Pugin), and the Shire Hall, Albert Hall, etc. There is also an art gallery in Victoria Street.

Facilities for educational advancement in the city are on a wide and generous scale. The education authority is responsible for primary, secondary, and grammar school education, and development is taking place to provide all forms of educational activity. In the sphere of further education, a college of art and crafts, a technical college, and many evening institutes have been provided. There are 2 high schools, namely, the boys' and the girls'. Ancillary services provided by the Education Committee include the school health service, school clinics, a child guidance clinic, open-air schools, and a school meals service. The N. Playhouse Theatre, a non-profit-making venture, was begun in Nov. 1948 and is run by a trust representing the various interests of city and univ. N. Univ. (q.v.) is housed in a beautiful new building erected by Sir Jesse Boot, later the 1st Lord Trent, in a park on the outskirts of the city in a setting of exceptional beauty, and was opened by George V in 1928. The park adjoining the college is 260 ac. in extent. Within a few minutes from the centre of the city is Wollaton Park (744 ac. in extent) with its magnificent Elizabethan hall, now a natural hist. museum. There are many fine parks and recreation grounds catering for all types of sport and recreation. Newstead Abbey, the home of Lord Byron, the poet, and of great historical interest, came into the possession of the corporation in 1931, the ceremony of handing over the property being performed by M. Venizelos, then Prime Minister of Greece. The abbey contains many fine Byron relics.

The city, which sends 4 members to Parliament, is governed by the city council, consisting of 68 elected members. There

is a lord mayor, a sheriff, 17 aldermen, and 51 councillors. The prin. industries include the manuf. of lace, hosiery, chemicals, mechanical products, tobacco, cycles, and general engineering works. Other important industries are bleaching, dyeing, spinning, tanning, brewing, and furniture. The water supply, health services, public lighting, and transport undertakings are all owned and controlled by the municipality. The amenities of the city include numerous public baths, libraries, and parks, an art gallery, and 2 museums. Over 20,000 houses have been built by the N. Corporation and it is estimated that a further 20,000 will be required during the next 20 years. There is a central retail market, a wholesale market, a cattle market, and a public abattoir, all municipally owned. The famous N. Goose Fair is held in Oct. each year. Pop. 311,500. See D. Gray, *Nottingham through Five Hundred Years: a Short History of Town Government*, 1949.

**Nottingham, University of**, at Highfields, 2½ m. from the centre of N. (q.v.), is a development of the former Univ. College (opened 1881). In 1903 the college received its royal charter of incorporation, and in 1920 it estab. the first fully constituted dept of adult education in the country. The foundations for an independent univ. for N. were laid by Jesse Boot, 1st Lord Trent, the N. industrialist, who spent about £1,000,000 on the univ. park and buildings. In 1948 a royal charter granted full univ. status. The Midland Agric. College, at Sutton Bonington, was in 1947 transferred to the univ. as its school of agriculture. The central univ. buildings, the Trent building containing the library, administration, and (at present) many teaching depts, and the Portland Building containing refectories, common-rooms, and student amenities, are finely placed on the upper slopes of a broad-backed ridge overlooking an ornamental lake. To the E., the Biology Building is the first in what is planned to be the sciences area. On the perimeter of the Univ. Park of 260 ac. are 4 halls of residence: Hugh Stewart and Wortley Halls for men, and Florence Boot and Florence Nightingale Halls for women; a third men's hall will shortly be built. There are between 2000 and 2500 students in the 7 faculties of arts, law, social science, education, pure science, agriculture and horticulture, and applied science.

**Nottinghamshire (Notts)**, midland co. of England, bounded on the W. by Derbyshire, S. by Leics, E. and NE. by Lincs, and NW. by Yorks. In ant. times it formed part of the kingdom of Mercia, and was subjected to many incursions from the Danes. At the time of the dissolution of the monasteries there were 40 religious houses in N., but the only important remains are those of Newstead Abbey. There are some fine churches, including Southwell Minster, of Norman date, and some splendid mansions in the Dukeries. The surface of the co. varies, part of it being a continuation of the Yorks plain, rising towards the W., where

the Robin Hood Hills reach an elevation of over 600 ft. Near to these hills lies Sherwood Forest, famous for its connection with Robin Hood, and now mostly included in the parks that form what is known as the Dukeries. The prin. rvs. are the Trent, Erewash, Soar, and Idle. On the W. there are extensive coal-mines, Nottingham, Mansfield, and Work-sop being the chief centres. Sandstone, limestone, and clay are worked. The prin. manufs. are lace and hosiery; there are also silk, worsted, woollen- and cotton-mills, iron foundries, and cycle works, and at Beeston machinery and motor works, while there are tobacco factories at Nottingham. The greater part of the co. is under cultivation, and there are numerous hop gardens. Agriculture and farming flourish in the E., and there are large apple and pear orchards. It is divided into 10 parl. divs., 4 of which are in the city of Nottingham, each returning 1 member. Area 827 sq. m.; pop. 841,211. See Victoria Co. Hist., *Nottinghamshire*; A. C. Wood, *A History of Nottinghamshire*, 1947; (Christopher Marsden, *Nottinghamshire* (Co. Books Series), 1953.



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LOBSTER FISHERMEN IN NOVA SCOTIA

**Nottinghamshire and Derbyshire Regi-**  
ment, see SHERWOOD FORESTERS.

**Notus** (Gk name for the S. or SW. wind).  
see AUSTER.

**Noumésa**, or Numea, also called **Port-de-France**, cap. of the Fr. colony of New Caledonia, on the Bay of N. on the SW. coast of the is. It has an excellent harbour which exports nickel, chrome, and copra. N. was an aircraft-carrier base in the Second World War. Pop. 10,400.

**Noumenon** (from Gk *noein*, to know),

in philosophy, a term introduced by Kant (q.v.) and rarely used apart from the consideration of his own philosophy. According to him, noumena are the real objects in themselves lying behind the phenomena, a phenomenon being defined as the 'undetermined object of an empirical intuition.' The noumenal world he held at first to be completely unknowable, since we can only recognise phenomena; but later he teaches that introduction to it is given by the practical reason, the

terminates at Cape Chignecto. The highest point is the Ingonish Mt in Cape Breton. The N. and S. Mts, 200 to 600 ft high, shelter the fertile Annapolis valley. On the Atlantic side of the coast between Cape Canso and Cape Sable is situated the harbour of Halifax. The Pictou harbour is the most important on the N. coast. Minas Bay, an inlet on the E. arm of the Bay of Fundy, penetrates some 60 m. inland, and terminates in Cobequid Bay. The prin. rivs. are the Annapolis, Avon,



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#### LOGGING IN NOVA SCOTIA

capacity which we exercise as moral agents.

**Nova Gôa**, or **Pangim**, cap. of Portuguese India since 1843, and of Gôa (q.v.), port on an inlet of the Arabian Sea, 255 m. SSE. of Bombay, once a suburb of Old Gôa. Salt is worked locally, and there is a trade in rice, copra, fish, salt, and other products. Pop. 14,200.

**Nova Scotia** (Fr. *Acadia*), prov. of the dominion of Canada, lying between 43° and 47° N. and 59° 40' and 66° 25' W. It consists of 2 portions, N. S. proper, a large peninsula, and the is. of Cape Breton (q.v.), separated from it by the Gut of Canso, now joined by Canso Causeway. N. S. proper extends 280 m. NE. and SW.; but its combined length with Cape Breton is. is 350 m. The isthmus of Chignecto, 11½ m. wide, connects it with the prov. of New Brunswick. The Cobequid chain of hills stretches from E. to W. and

Shubenacadie, the E., Middle, and W. rivs. of Pictou, the Musquodoboit, and the Lahave. The fresh-water lakes are Lake Rossignol, situated in Queen's co., and 20 m. long; Ship Harbour Lake, 15 m. in length; and Grand Lake, both of which are in Halifax co. The climate of N. S. is more temperate than that of New Brunswick, and the air as a general rule is very wholesome. Area 21,068 sq. m.; pop. 642,584. The cap. is Halifax. Other large tns are Sydney, Glace Bay, Dartmouth, and Truro. Indians are scattered throughout the prov. The local legislature consists of a House of Assembly of 37 members, at the head of which is appointed a lieutenant-governor by the Federal Gov. for a term of 5 years. Education throughout the prov. is free and compulsory. Chief univs.: King's College, Halifax (Anglican), founded in 1789; Acadia Univ., Wolfville (Baptist), founded

in 1838; St Francis Xavier, Antigonish (Rom. Catholic), founded in 1866; and the Dalhousie Univ., Halifax (undenominational), founded in 1818. An agric. college was founded at Truro (1905).

Agriculture is important, especially poultry raising, dairy farming, and fruit growing, particularly apples. The fisheries are also an important industry in N. S., employing over 18,000 men, and being valued at over \$38,000,000. Much fresh and frozen fish is shipped to market. Lumbering, the manufacturing of wood-pulp for paper, fish-processing, and mixed farming occupy an important section of the pop. In N. S. the greater part of the forest land, amounting to 15,200 sq. m.,

(except limestone, gypsum, and building materials) are the property of the Crown, but are administered by the minister of public works and mines. The Canadian National Railway, owned and worked by the Federal Gov., is the chief means of communication with the other provs. The Canadian Pacific Railway has running powers within a certain part of the prov.

The hist. of N. S. dates from the visit of the Cabots in 1497-8, but not until 1605 was any attempt at colonisation made by Europeans. In that year a number of Fr. colonists estab. themselves at Port Royal. The old name of the colony, which was Acadia, was changed in 1621 to N. S. by Sir Wm Alexander,



*The High Commissioner for Canada*

#### NOVA SCOTIA

A valley at North River, Cape Breton County.

has passed into private ownership, but the system of disposal of timber by licences to cut is now being followed. What remains vested in the Crown is administered by the chief forester under the minister of lands and forests. The prin. trees are spruce, fir, pine, birch, hemlock, oak, and maple. Many men work in the construction trades. The leading manufacturing industries are steel products, pig and rolled iron, and ferro-alloys; fish-curing; saw-mills; biscuits and confectionery; dairy produce; railway rolling stock; hosiery; and castings and forgings. Manufacturing is, to a considerable extent, dominated by the steel industry. The gross value of manufactured products is about \$325,000,000. The chief mineral product is coal (which was produced as early as the 18th cent.), which is subjected to a royalty of 12½ cents per long ton. There are 1000 sq. m. of known coal-fields. Other minerals are salt, lead, zinc, copper, clay products, manganese, gypsum, and limestone. The ann. value of the mineral production of N. S. is from \$65,000,000 to \$70,000,000. All minerals in N. S.

who received a grant of what are now the Maritime Provs. from James I, intending to colonise the whole of it. His settlements were a failure, but from this grant N. S. obtained her name, her coat-of-arms, and her flag. The French were granted the possession of the colony by the treaty of St Germain-en-Laye (1632). The Fr. settlers, however, quarrelled among themselves, and Cromwell in 1654 sent a force to occupy the settlement. Charles II, by the treaty of Breda (1667), restored N. S. to the French; but not until Britain took possession of the colony in 1713, according to the treaty of Utrecht, was peace possible among the colonists. In the treaty of Paris (1763) France resigned all claim upon the country, and in 1820 Cape Breton united with N. S. Representative gov. was granted as early as 1758, and a fully responsible legislative assembly was estab. in 1848 through the instrumentality of Joseph Howe. In 1867 the prov. entered the dominion of Canada.

See D. Campbell, *Nova Scotia*, 1873; Sir J. Bourinot, *Builders of Nova Scotia*; T. C. Haliburton, *History of Nova Scotia*;

H. S. Philpot, *The Province of Nova Scotia: Resources and Development*, 1930; L. R. Ward, *Nova Scotia: the Land of Co-operation*, 1942; G. Campbell, *The History of Nova Scotia*, 1948; W. L. Bird, *This is Nova Scotia*, 1950.

**Novae**, or **New Stars**, are stars which are suddenly perceived, after having been previously invisible. The outburst of brilliance is usually temporary. Probably new stars of small brilliancy are of not infrequent occurrence, but of the larger magnitude, such, for instance, as are visible to the naked eye, the number has been few. One such was observed by Hipparchus, the father of astronomy. Tycho Brahe observed the brightest recorded nova on 6 Nov. 1572, in the constellation of Cassiopeia, and in Oct. 1604 Kepler and Galileo saw one in Ophiuchus. The latter, and one seen in Vulpecula by Antheim in 1670, were the only N. seen in the 17th cent.; but 8 were found in the 19th cent. Since 1900 nearly 100 N. have been discovered, though generally they were invisible to the naked eye. The discovery of N. has been facilitated by the examination of photographic plates. Two of the most important N. in recent years have been Nova Aurigae (1892) and Nova Persei (1901), both of which were discovered with the naked eye by Dr Anderson at Edinburgh. When discovered on the morning of 22 Feb. the magnitude of the latter was 2.8, next day it was 10 times as bright, outshining all northern stars, after which it declined till in 1903 it was of the twelfth magnitude. In 1918 Nova Aquilae achieved a brightness second only to Sirius; in 1942 Nova Puppis reached the first magnitude. It is probable that the outer envelope of the star is blown off by some immense explosion, though other theories have been suggested. Occasionally super-N. are discovered. These increase in brightness much more than ordinary N., but are so far away that they are known only by photographic records.

**Novas, Bartholomeu**, see DIAZ.

**Novasium**, see NEUSS.

**Novák, Vítězslav** (1870–1949), Czech composer, b. Kamenice. He was the son of a doctor, but lost his father early and had to support the family by teaching. While studying law at Prague Univ. he attended the Conservatory, studying the pianoforte with Jiránek and composition with Dvořák, who persuaded him to devote himself wholly to music. He soon made a career as a distinguished teacher of composition, and in 1909 was appointed prof. at the Conservatory. After the First World War, which regained his country's independence, he became prof. of the 'Master School' and was its director in 1919–22. Works include operas, *The Imp of Zvíkov*, *A Night at Karlstein*, *The Lantern*, and *The Grandfather's Heritage*; ballets, *Signorina Gioventù* and *Nikotina*; cantatas, *The Storm*, *The Spectre's Bride*; and choral ballads; symphonic poems, *In the Tatra*, *Eternal Longing*, *Toman* and *The Wood Nymph*; overtures, *The Corsair* (after Byron), *Maryša*, *Lady Godiva*, instrumental pieces, and songs.

**Novalis**, literary name assumed by **Friedrich von Hardenberg** (1772–1801), Ger. poet and philosopher, b. Oberwiesenthal, Thuringia. He studied at Jena, Leipzig, and Wittenberg. He then went to Armstadt, where he became enamoured of the 15-year-old Sophie von Kähn. In 1795 N. was made auditor of the Saxon Salt Works, of which his father was director. The death of Sophie and of his brother Erasmus, both in 1797, was a severe shock to N. *Hymnen an die Nacht*, 1800, were written about this time. The tragedy aroused in N. a poetic and mystic strength. Feeling himself ecstatically united with the dead beloved, he tried to free the spirit from material things. Many of his poems contain a note of mysticism. He commenced the romance *Heinrich von Ofterdingen* in 1800, but never completed it; in 1802 were pub. his *Geistliche Lieder*. N. is now considered one of the most important of the early romantics. His works were collected and ed. by his friends L. Tieck and F. Schlegel in 1802. Later eds. are those of J. Minor, 1907; P. Kluckhohn (with diaries), 1928; C. Seelig, 1946. See studies by E. Hellborn, 1901; R. Samuel, 1925; J. von Minnegerode, 1941.

**Novara**: 1. Prov. of Italy, in NE. Piedmont (q.v.). It is mainly in the Alps (q.v.), and is bordered on the north by Switzerland. The prov. contains the W. shore of Lake Maggiore (q.v.). The princ. towns include N., Borgomanero, and Domodossola (q.v.). Area 1250 sq. m.; pop. 433,000.

2. (anc. **Novaria**) It. tn, cap. of the prov. of N., 52 m. NE. of Turin (q.v.). Charles Albert (q.v.) of Sardinia was defeated here by the Austrians in 1849 (see ITALY, History). There is a fine 19th-cent. cathedral, to which is attached a very anc. baptistry. Other buildings of note are the 13th-cent. tn hall, the 15th-cent. mayor's palace, and the ruined Sforza (q.v.) castle. N. is an important agric. centre, and has textile, engineering, and chemical industries. There is also a trade in Gorgonzola cheese and rice. Pop. (tn) 58,400; (com.) 72,400.

**Novaria**, see NOVARA.

**Novatian**, priest at Rome in the 3rd cent. He was converted to Christianity after reaching manhood, and was admitted to holy orders by Pope St Fabian. In the discussion about those who had lapsed during the Decian persecution (250–1) N. opposed the policy of leniency adopted by Pope Cornelius. N. was in consequence put forward by his followers as an anti-pope. A Rom. synod pronounced him schismatic, and he was excommunicated and d. in prison. His bones were brought to Rome, where he was honoured as a martyr. His influence spread, and Novatianism was estab. in Carthage, Alexandria, Constantinople, and in Asia until the 7th cent. His followers claimed to be especially pure, and adopted the name of Cathari (not to be confused with the medieval sect of that name). In their doctrine they denied the power of the Church to absolve from mortal sin, and excluded all convicted sinners from the

communion of the Church. See A. d'Alès, *Novation*, 1925, and N. Kriebel, *Studien zur Trinitätslehre bei Tertullian und Novation*, 1932.

**Novation**, merging of one legal obligation into another so as to extinguish the former and give a right of action only on the latter. For example, A owes B £100 for money lent, and later signs a cheque for the amount. B cannot sue A on his personal obligation to repay, but only on the cheque; and if the bank on which the cheque is drawn should fail in the meantime B would never get his money. A N. is invalid unless both parties consent to it. The term N. is rarely employed in Eng. law, the effect of merger of old obligations being determined either by the ordinary principles of contract (q.v.) or by statute.

**Novaya Zemlya** ('New Land'), Arctic archipelago consisting of 2 large and sev. small is. off the coast of European Russia, to which it belongs. Total area 35,000 sq. m. The N. Sea Route (q.v.) passes through the Strait of Matochkin Shar between the 2 main is. or through Yugorskiy Shar S. of the S. is. It is very sparsely inhabited by Samoyeds (q.v.), who engage in reindeer raising, trapping, and the collection of elder down, and Russians working on meteorological stations. Novgorodians are said to have visited the is. in the 11th cent.

**Nové Zámky** (Ger. Neuhäusel; Magyar Érsekújvár), Czechoslovak tn in the region of Nitra (q.v.), on the Nitra. It was in Hungarian hands, 1938-45. There are textile and leather manufs. Pop. 17,000.

**Novel**. The term N. may be said to denote a prose story. In its original use it meant a fresh story, but very soon it came to denote any story or tale in prose as opposed to a story in verse, which latter retained its old appellation of romance. Medieval romance dealt with a legendary past. The N., which seems to have had its origin in Italy soon after the Renaissance through the stimulus of foreign travel, dealt with the realities of everyday life and therein lay its fundamental attraction. Italy was indeed the home of the N., for it was there that Boccaccio (q.v.) wrote his prose tales of amorous adventure, the *Decameron*, styled 'Novelle Storie' or 'Fresh Tales,' which had so profound an influence on the subsequent development of prose fiction. Nowadays the term romance is sometimes loosely used as a synonym for N. or fiction—an instance of deteriorated meaning of a word; while, in a narrower sense, the term romantic is used to differentiate N.s of adventure or fancy or historical N.s from realistic N.s, which are designed to represent life as it is rather than as idealised.

**ANCIENT CLASSICAL PROSE FICTION**. The earliest known Gk prose fiction were the lost *Milesiaca* of Aristides (2nd cent. BC), trans. in the next cent. by Cornelius Sisenna. The *Ass* and other romances included in the works of Lucian (q.v.) belong to the 2nd cent. AD. The following 'erotic' N.s date from the 3rd cent.: Xenophon of Ephesus, *Ephesiaca*; Longus, *Daphnis and Chloë*; Achilles Tatius, *Leucippe and Clitophon*; Heliodorus of

Trikka, *Aethiopica*. To this last work Tasso, Guarini, and others were largely indebted. The Gk version of *Barlaam and Josaphat* (q.v.) is a work of the late 7th or early 8th cent. AD, but appears to derive from a Sanskrit original.

Two famous Lat. works of fiction have survived: the *Satyricon* of Petronius (q.v.) and the *Metamorphoses* or *Golden Ass* of Apuleius (q.v.). These date respectively from the 1st and 2nd cent. AD.

**CHINESE PROSE FICTION**. For an account of the novel in the Mongol dynasty, see CHINESE LITERATURE.

**ROMANTIC FICTION IN WESTERN EUROPE** is the product of new historical circumstances, which were but slightly affected by Byzantine influences. The *Erotikoi* reflect a corrupt and decaying civilisation; but medieval romances suggest a youthful, vigorous, and growing social life. They appear to have had their root and foundation in chivalry, and although the exploits and the marvels may have often been derived from foreign sources, yet the spirit, scenery, sentiment, and life of the legends reflect the characteristics of the earlier ages of feudalism. Medieval romances are divisible into 3 great series: (1) those relating to Arthur (q.v.) and the Knights of the Round Table; (2) those relating to Charlemagne (q.v.) and his Paladins; (3) those relating to Amadis de Gaul (q.v.) and his descendants. Besides the 3 distinct series of romance above mentioned, a fourth perhaps deserves mention, in which the heroes of antiquity are grotesquely tricked out in the costume of medieval knights. The prin. are the romances of *Jason and Medea*, of *Hercules*, of *Oedipus*, and of *Alexander*. They are all written in French, and the first 2 profess to be the work of a Raoul le Febvre.

**DEVELOPMENT AND INFLUENCE OF FICTION IN ITALY**. The Italians originated no romances of the kind described above. The earliest It. work of this sort is the *Cento novelle antiche*, commonly called *Il Novellino*. It is a compilation by different hands, all unknown. It was followed in 1348-53 by the *Decameron* of Boccaccio, finer in point of humour, sentiment, and style, but not more original in the matter of story than *Il Novellino*. Its influence on early European literature was prodigious. Chaucer and Shakespeare in England were greatly indebted to it for incidents and plots; while in France Boccaccio had a number of distinguished imitators. In his own country his influence was so overwhelming that for some cents. It. novelists could do nothing more than attempt to copy him. The prin. of these imitators are Franco Sacchetti, Ser Giovanni, Massuccio di Salerno, Sabadino degli Arienti, Agnolo Firenzuolo, Luigi da Porta, Molza, Giovanni Brevio, Girolamo Parabosco, Marco Cademoste da Lodi, and Giovanni Giraldo Cinthio. Cinthio was the greatest favourite of all the It. novelists with the Elizabethan dramatists. Besides these we may mention Antonio Francesco Grazzini, Straparola, and Bandello. A very different class of fiction is the *spiritual romance*. It



originated in the bosom of the Church. The first of the series is *Barlaam and Josaphat*, but by far the greatest work of the kind produced in the Middle Ages is the *Legenda Aurea*, or Golden Legend (q.v.). Besides these may be mentioned a species of spiritual tale, the *Contes Dévots*, popular in France during the 12th and 13th cents., which was written by monks.

**ROMANCE OF THE SIXTEENTH AND SEVENTEENTH CENTURIES.** During the 16th and 17th cents. 4 different kinds of N. were cultivated: (1) the comic romance, (2) the political romance, (3) the pastoral romance, (4) the heroic romance.

*Comic romance* substantially begins in modern times with Rabelais (q.v.), styled by Sir Wm Temple the 'Father of Ridi-cule.' Rabelais, in his inimitable burlesque romance, scoffs (with the tone of a sceptic, however) at the vices of the clergy, the crooked ways of politicians, and the jargon of philosophers. The next remarkable romance of a comic nature is the *Vita di Bertoldo*, 1618, of Giulio Cesare Croce, a work recounting the humorous and successful exploits of a clever but ugly peasant, which for 2 cents. was as popular in Italy as *Robinson Crusoe* or the *Pilgrim's Progress* in England. A few years earlier appeared *Don Quixote*, 1605 (see CERVANTES), in which 'war to the knife' was proclaimed against the romances of chivalry. Almost contemporaneous with *Don Quixote* was another Sp. romance, Mateo Aleman's *Life of Guzman de Alfarache*, 1599 (trans., 1623), which gave birth to a host of Sp. romances with beggars and scamps for heroes, of which the best is the *Lazarillo de Tormes*, 1586, of Diego de Mendoza (see also PICARESQUE NOVEL). In the following cent. France produced, among others, Scarron's *Roman comique*, 1651-7, and Furetière's *Roman bourgeois*, 1666.

*Political romance.* The earliest of the series is the *Utopia*, 1516 (first trans. from original Latin into English, 1551) of Sir Thomas More (q.v.); next comes the *Argenis* of Barclay (q.v.), pub. in 1621; and to the same class belong a variety of Fr. romances, of which by far the most famous is the *Télémaque*, 1699, of Fénelon.

*Pastoral romance.* The first important work of the kind is the *Arcadia*, 1501, of Sannazzaro, written in Italian. It was followed by the *Diana*, 1559, of Montemayor, written in Spanish, sev. of the episodes of which are borrowed from the It. novelists, while Shakespeare has in turn directly taken from it the plot of the *Two Gentlemen of Verona*, 1623, as well as some of the most amusing incidents in his *Midsummer Night's Dream*, 1600. In this class may be included also Sir Philip Sidney's (q.v.) *Arcadia*, 1590.

*Heroic romances.* The first of this long series was the *Pincendre*, 1632, of Marin le Roy de Gomberville. His successor, La Calprenède, wrote *Cassandra* (10 vols.), 1644-50, *Cléopâtre* (12 vols), 1646-57., and *Pharamond*, 1662. But the most prolific of the school is Mlle de Scudéry, whose prin. romances are *Arlamène ou le grand Cyrus*, 1648-53, *Clélie*, 1654-61, *Ibrahim*, ou *l'illustre*

1661, *Histoire romaine*, and *Almahide*, 1661-3.

**NOVELS AND ROMANCES OF THE EIGHTEENTH CENTURY.** The 2 European nations that most brilliantly distinguished themselves in the dept of fiction during this cent. were England and France.

*English prose fiction.* During the age of Elizabeth and her immediate successors, the imaginative genius of England, from various causes, had taken an almost exclusively poetical direction, and, with the exception of Sidney's pastoral of *Arcadia*, 1590, and Bunyan's (q.v.) *Pilgrim's Progress*, 1678 there is little in the shape of a N. or a romance for 100 years. At the beginning of the 18th cent. England was entering on the most prosaic, unimaginative, and unheroical period of her hist. Its characteristics are faithfully reflected in most of its novels, which possess a great historical value apart altogether from their literary merits. The first name that occurs is of the notorious Aphra Behn (q.v.), the greater number of whose novels, of which *Oroonoko*, 1678, is the best known, appeared towards the close of the reign of Charles II. But the first novelist of genius belonging to the new era is Daniel Defoe (q.v.), the father of modern Eng. prose fiction, in whose writings—*The Adventures of Captain Singleton*, 1720, *The Fortunes of Moll Flanders*, 1722, *The History of Colonel Jack*, 1722, etc.—the coarse, homely, unpoetical, but vigorous realism of the time is strikingly apparent. *Robinson Crusoe*, 1719, is the finest and the most famous of all that class of fiction which was extensively cultivated in both France and England. After Defoe is Samuel Richardson (q.v.) with *Pamela*, 1740, *Clarissa*, 1748, and *Sir Charles Grandison*, 1754. Fielding thought Richardson untrue to nature and wrote his first N., *Joseph Andrews*, 1742, as a burlesque on the style of his predecessor. Like his subsequent performances, *Tom Jones*, 1749, and *Amelia*, 1752, it represents society as Fielding's sharper eyes saw it—on the whole gross, vulgar, and impure. T. G. Smollett (q.v.) writes in the same spirit as Fielding. His chief works are *Roderick Random*, 1748, *Peregrine Pickle*, 1751, *The Adventures of Ferdinand and Count Fathom*, 1753, and *Humphry Clinker*, 1770. Laurence Sterne exhibits a genius so whimsical, peculiar, and original that it is almost impossible to class him with any of his contemporaries; his *Tristram Shandy*, 1760-7, stands by itself.

In 1766 appeared Oliver Goldsmith's (q.v.) *Vicar of Wakefield*, in which a change for the better, from a moral point of view, is noticeable. With the exception of Richardson, all the novelists above mentioned are usually described as humorists. The pub. of Percy's *Reliques* reawakened an interest in the age of chivalry and romance. The first of the modern romantic school was Horace Walpole (q.v.) whose *Castle of Otranto* was pub., 1769. He was followed by Clara Reeve, the authoress of *The Old English Baron*, 1777; but the greatest genius in this line was undoubtedly Mrs Radcliffe (q.v.), whose

*Mysteries of Udolpho*, 1794, and other works were abundantly imitated. Her ablest successors were Matthew Gregory Lewis, author of *The Monk*, 1795, and Charles Robert Maturin, author of *Fatal Vengeance, or the Family of Montorio*, 1807.

*Romance in which the incidents, though natural, are purely imaginary.* This class corresponds with the modern conception of the N., and probably had its prototype in *Zayde*, 1670, and *La Princesse de Clèves*, 1678, by Mme de La Fayette (q.v.); but the first great name that adorns it is that of Marivaux (q.v.), whose *Vie de Marianne*, 1731, and *Paysan Parvenu*, 1735, were long in favour. Next to Marivaux comes the Abbé Prévost, chiefly remembered by *Manon Lescaut*, 1731. Other writers belonging more or less strictly to the same div. are Mme Riccoboni and Rousseau.

*Humorous and satirical romance.* By far the most celebrated specimens of this kind of fiction are the *Diable boiteux*, 1707, *Gil Blas*, 1715-35, and *Le Racheur de Salamancue*, 1736, of Lesage (q.v.). Voltaire (q.v.) may claim to rank among these in virtue of his *Zadig*, 1748, *L'Ingénu*, 1757, *Candide*, 1759, and *La Princesse de Babylone*, 1768.

*Fairy tales.* The immediate forerunner and prototype of the Fr. fairy tales was the *Perlamerone*, 1788, of Signor Basile. This attracted and stimulated the fancy of Charles Perrault, whose *Histoires ou contes du temps passé* appeared in 1697. His prin. successors were the Comtesse d'Aulnoy, Mme Murat, and Mlle de La Force.

PROSE FICTION OF GERMANY DURING THE EIGHTEENTH AND EARLIER NINETEENTH CENTURIES. Towards the close of the 18th cent. writers became more numerous, and as the literary activity of many of them continued on till the first or second quarter of the 19th cent., it will be most convenient and natural to treat both cents. together. The first eminent Ger. novelist of this period was Wieland (*Geschichte des Agathon*, 1766-7, and *Oberon*, 1780). The prin. names of novelists influenced by Richardson and Fielding are August la Fontaine, Wetzel, Maler, Müller, Schulz, and Hippiel. Almost contemporary with these there flourished for a brief period (1780-1800) a school whose works had their poetic counterpart in Schiller's *Die Räuber*, 1781. Chief writers of this *Sturm und Drang* (q.v.) period are Cramer, Spiers, Schlenkert, and Velt Weber. Alone and far above all others in abundance and originality of fancy, humour, and pathos, towers Jean Paul Richter, *Quintus Fidelein*, 1796. Apart from all schools stands Johann Wolfgang von Goethe (q.v.), whose N.s *Die Leiden des jungen Werthers*, 1774, *Wilhelm Meisters Lehrjahre*, 1795-6, *Die Wahlverwandtschaften*, 1809, *Wilhelm Meisters Wanderjahre*, 1829, as well as his poems, are poetico-philosophic efforts to represent, perhaps to solve, the great facts and problems of human life and destiny. *Wilhelm Meister* became the prototype of the romantic N. and influenced in particular *Franz Sternbalds Wanderungen*, 1798, by

Ludwig Tieck, and Wackenroder, and Novalis's *Heinrich von Ofterdingen* (unfinished, pub. among his *Works*, 1802). Other distinguished names are those of De la Motte Fouqué, Adelbert von Chamisso, Achim von Arnim, Clemens Brentano, and E. T. A. Hoffmann.

SOME ENGLISH FICTION OF THE NINETEENTH CENTURY. The cent. began with the ironical, perceptive genius of Jane Austen, but her immediate influence was annulled by Scott's Waverley N.s, which set the fashion for historical romance throughout Europe. Though he had some antecedents, including Maria Edgeworth's pictures of Irish life in *Castle Rackrent*, 1800, Scott may be said to have been the real inventor of the historical N. Possessed at once of far greater antiquarian learning, imaginative genius, common sense, and instinctive taste than any of his 'romantic' predecessors, he knew precisely what to shun and what to choose. The political reaction that took place in Britain showed itself in literature too, and Sir Walter Scott was its grandest representative. He strove to delineate the past as it seemed in the eyes of men who were dubious of the present and afraid of the future. The overpowering genius of Scott necessarily led to endless imitations. Galt and Wilson portrayed aspects of Scottish life which the author of *Waverley*, 1814, had passed over. After Scott, Bulwer (Lord) Lytton developed romantic and historical fiction, but his domestic N.s reflected Jane Austen's belated influence on the popular taste. Her powers of observation were inherited by George Eliot, who in 1853 pub. in 2 vols. *Scenes of Clerical Life*. Her later N.s entitled her to rank as one of the 3 great Eng. novelists of the 18th cent. The other 2, Dickens and Thackeray, brought the Eng. social N. to its zenith and with their work may be linked the philanthropic N.s of Mrs Gaskell and the 'Barneshire N.s' of Anthony Trollope. Among much talented and individual work may be noted the nautical N.s of Marryat; the political N.s of Benjamin Disraeli; the sporting and military N.s of Charles Lever; the brilliant 'muscular Christian' N.s of Charles Kingsley; the 'governess N.s', as they have been aptly denominated of Charlotte Brontë; the 'school' N.s of Thomas Hughes and Dean Farrar; and the 'sensational' N.s of Wilkie Collins, Miss Braddon, and others. Other authors not less eminent are Mrs Oliphant and Charles Reade. One novellist of this period stands apart from his contemporaries: Thomas Love Peacock, who invented a N. of shadowy characters, containing irony and conversation and a mockery of romantic excesses. See also the separate articles on the authors named in the above paragraphs.

TENDENCIES IN THE EUROPEAN NOVEL IN THE SECOND HALF OF THE NINETEENTH CENTURY. At the cent.'s beginning, in addition to the lyrical and personal romances of F. R. Chateaubriand and Mme de Staël, the Fr. N., in the hands of De Vigny, Victor Hugo, and, in its decline,

of Dumas père and Eugène Sue, was mainly historical. The influence of Goethe and the Ger. romance was manifested in France in the idealistic N.s of George Sand. Then, with a greater admixture and realism, come the N.s of Honoré de Balzac, who set out to give an exact picture of contemporary manners. Allied to him in the 'realist' school are Stendhal and Prosper Mérimée, while the second half of the cent. is dominated by Gustave Flaubert, who succeeded in fusing the romantic and the realistic. He, like Balzac, portrayed the physical environment of life as the determining factor in character, and from his work derives the modern N. as a conscious artistic form. Before Flaubert and his contemporaries the only comparable author is Jane Austen, who is their equal in form. From Flaubert are descended directly such later Eng. writers as George Moore, while others who reveal more or less directly the influence of the Fr. naturalistic movement from Flaubert to Zola are Hardy, Gissing, and Conrad. Leaving aside a romantic recrudescence by followers of George Sand—Feuillet, Cherbuliez, and Fromentin—the naturalist N. was further developed by the brothers Goncourt and Alphonse Daudet, but naturalism was not formulated into a theory of art until Emile Zola did so. He and De Maupassant were responsible for the spread of naturalism throughout Europe, evidenced in the Swedish August Strindberg, in the Ger. social N.s of Spielhagen, Theodor Fontane, Otto Ludwig (*Zwischen Himmel und Erde*, 1855), the Swiss Jeremias Gotthelf and Gottfried Keller (*Der grüne Heinrich*, 1851-3), and in the Sp. realist, José Maria de Perda, followed by Armando Valdes. In the It. N. Fr. influence is recognisable. The chief of the It. realist school is Giovanni Verga, whose most prominent followers were Luigi Capuana, De Roberto Fogazzaro, and D'Annunzio, all of whom also achieved European reputations, though their talent is more romantic than that of their contemporaries. In England the influence of the Fr. naturalists is seen, especially in the works of Arnold Bennett, but the Eng. social N. is indigenous, and has tended towards sociological study—witness the work of H. G. Wells and John Galsworthy. The Eng. N. is loose in structure, a fact which Flaubert deplored, and in this respect is allied more with the Russian N. than with the French.

The first part of Tolstoy's *War and Peace* appeared in 1862 and the work was completed 7 years later. Realism, which in W. Europe was a moral revolt against untrue romanticism, was, in Russia, a natural growth free from theorising, being present before Tolstoy in Gogol and Turgenev, and after him in Goncharov and Dostoyevsky. The contribution of the Russian novelists, epitomised in Tolstoy, is in the shift of emphasis from the physiological to the psychological. Though Tolstoy was Russia's greatest novelist it was Turgenev who influenced European literature most, since he combined Russian concentration on the psychology of his characters with Fr.

artistry and compactness of form. By this fusion Turgenev may be said to have bridged effectively the gap between W. and E. European literary currents. See the articles on the individual European writers named.

**THE MODERN NOVEL.** Since other classes of imaginative literature, both the drama and some kinds of poetry, are so closely akin to the N. it is not easy to discuss fundamental questions regarding the N. without trenching upon matters relating to these other classes. Thus the *Aeneid*, *The Ring and the Book*, and *The Dynasts* are essentially N.s in verse and, apart from points of poetic technique, any discussion of the N. in general applies as validly to them as, for example, to *War and Peace* and *Martin Chuzzlewit*.

The 20th-cent European N. is distinguished by variety and licence of experiment. The novelist has become the purveyor of life's experience for the benefit of those whose experience is limited, and this has approximated fiction to journalism (not in a derogatory sense). It has been said that H. G. Wells (q.v.) was a pioneer in the attempt to transform the N. into an intellectual clearing-house. The result of this attempt has been to bring into vogue the unsymmetrical or shapeless N. Wells's later N.s, and those of Proust, Joyce, Virginia Woolf, and Dorothy Richardson (qq.v.), and, in America, Wm Faulkner, Hemingway, and many others (see next section) are amorphous in the sense that they all show a strong tendency to free the art of N.-writing from the accepted canons of plot and dialogue so as to give scope for altogether wider activities. The element of justification in this 'shapeless' construction was that the 'realism' or 'naturalism' of the older N.s, such as those of Zola, the Goncourt brothers, George Gissing, and Arnold Bennett, was not really true to life. Hence this reaction to ultra-realism and the N. which pretends to reveal the 'stream of consciousness,' i.e. the N. which aims at getting rid of everything that might stand between the reader and the reflections in the character's mirror of consciousness. But this experimentation went to extreme lengths, as in Joyce's *Ulysses*, 1922, in which the 'recurrent themes' and 'internal rhythms' seem to have no permanent value (see further under JOYCE, JAMES). *The Voyage Out*, 1915, and other N.s of Virginia Woolf reveal a world of radiance and a high degree of sensitiveness, emotional and intellectual, yet are often fragmentary in presentation and wanting in continuity of narrative. But in these 'shapeless' N.s the characters seem to have no existence outside the author's mind. At least the characters of Wells, Galsworthy, Bennett, and Conrad were substantial. Proust's method attracted many copyists after his death in 1922. His long continuous N. *A la recherche du temps perdu* (trans. as *Remembrance of Things Past*), 1913, is a highly subjective work, which explores consciousness regardless of time sequence and with a leisurely reflectiveness. His characters' sole aim seems to

be to 'fill an infinite void of leisure with the satisfaction of insignificant appetites and the stimulation of largely artificial emotions.' The reader is indifferent to their fate, for their whole world dissolves into complete passivity, aimlessness, and futility. How different from the state of positive anxiety with which one follows the fortunes of the characters in a N. by Fielding, Trollope, or Hardy. Twentieth-century naturalism may be said to have ended with Arnold Bennett's *Riceyman Steps*, 1923; but the N.s of the 'shapeless school' which displaced it and seek realism in form rather than in content can hardly be condemned because they so far evade life as to avoid the central issues of our age, such as the threatened disintegration of society in the Democrat-Communist struggle. The day of the experimentalist may be said to be always dawning, but that of the traditionalist can never be said to be definitely past. Joseph Conrad was an experimentalist in a traditionalist framework. By contrast with his introspective brilliance Hugh Walpole was a mechanical traditionalist, painstaking, solid, undisturbed. E. M. Forster, in method, is a mid-19th-cent. novelist, displaying an orderly unfolding of story and character. Imagination is the most powerful element in his universe. Life as he sees it is supremely strange and it is only through the imagination that man can hope to penetrate its mystery. Sentimentality, which is pervasive in Virginia Woolf, is idealistic and incidental to Forster; while half-heartedness about sexual love may be said to be another impression made by both these novelists. A. P. Herbert's *The Water Gypsies*, 1930, is, in form, traditional, but has much in it that is fundamentally true to life. Its method is in sharp contrast with that of D. H. Lawrence, whose *Lady Chatterley's Lover*, 1928, illustrates the author's constitutional inability to deal dispassionately with certain emotional relationships (see further under LAWRENCE, DAVID HERBERT). Very different from the N.s of the experimentalists is the work of such writers as J. B. Priestley (q.v.), whose *The Good Companions*, 1929, is a reversion to the hurly-burly of Dickens's world; G. B. Stern, whose *Tents of Israel*, 1924, a 'family chronicle' N., has few superiors in that category; and F. Tennyson Jesse, whose *The Lacquer Lady*, 1929, is remarkable for vivid portrayal of varied experiences. The N.s of Aldous Huxley (q.v.) stand alone—devastating satires with something of the unemotional precision of the analytical chemist. His *Point Counterpoint*, 1928, and *Anlie Hay*, 1923, are essentially the N.s of a moralist who is out to expose by the process of stripping off the masks of falsity and cant, the ugliness of bohemianism and other aspects of contemporary life. Wyndham Lewis suggests that all art to-day is in fact satire. Thus he assumes that the Amer., Faulkner, is a 'ferce moralist, who operates upon the satiric plane, armed with sardonic weapons of aggression against the victims of his ethical rage,' and it is obvious that

his own N.s are of this genre. In this period too there were occasional successful essays in the field of fantasy, such as David Garnett's *Lady into Fox*, 1922, and Sylvia Warner's *Lolly Willows*, 1926.

The aftermath of the First World War brought N.s of disillusionment such as C. E. Montague's *Disenchantment*, 1922, Erich Remarque's *Im Westen Nichts Neues* (trans. as *All Quiet on the Western Front*), 1929; Richard Aldington's *Death of a Hero*, 1929, and H. M. Tomlinson's *All Our Yesterdays*, 1930—books of very varying literary quality but all alike a protest against war, without any attempt to exploit the social background as a cause of war. Among other novelists who have taken the war as their theme are Robert Graves, R. H. Mottram, Arnold Zweig, Jaroslav Hasek, and Herbert Read, whose N.s, unlike Tolstoy's masterpiece of the Napoleonic wars, deal rather with particular experiences than with general truths. Few of them have rivalled Henri Barbusse's (q.v.) *Le Feu*, 1916, which, in descriptive narrative, shirks nothing in the task of reflecting the fatigue, tedium, and horror of war. Two other notable war N.s *Ier Privates We*, by Private 19022 (Frederick Manning), 1930, and *War is War*, by Private X, 1930, the former, perhaps, the best Eng. N. on the war, are the work of educ. and imaginative men and not the unvarnished tales of characteristic private soldiers. Mottram's *The Spanish Farm*, 1924, a dispassionate and detached war N., is more remarkable for its central character, who seems to typify the Fr. farming woman in a war-scarred region throughout the cents., than for its narrative of experiences. H. E. Read's *In Retreat*, 1925, on the Fifth Army, is pseudo-fictional. Robert Graves's *Goodbye to All That*, 1929, like Stephen Graham's *Private in the Guards*, 1919, is a protest against military discipline and snobbery. *The Case of Sergeant Grischka* by Arnold Zweig, 1928, is a fine literary performance, yet its merit lies more in the travels of its unemotional hero than in its war interest. Hasek's *The Good Soldier Schweik*, 1930, is an extravagantly comic satire on military tyranny and pomposity.

In Germany, before the Hitlerian regime, there was a literature of revolt, which included the N.s of Heinrich and Thomas Mann, Theodore Plivier, and Ludwig Renn, most of it unknown in England. The N.s of Heinrich Mann, the acknowledged master of Wassermann and Feuchtwanger, portray a Germany in all its recent vulgar prosperity in the decades preceding the First World War. Thomas Mann's chief N., *Buddenbrooks*, 1901, may be described as the Ger. counterpart of the *Forsyte Saga*. After the collapse of the Weimar Rep. and the dawn of Nazism in Germany, came writers like Balder Olden, whose N.s give true pictures of demagoguery in the Vaterland; but such writers were either forced to escape or run the risk of internment in a concentration camp. Ger. literature as a whole, following the Nazi condemnation of the N.s of Remarque and Hans Fallada,

merely extols the law of the jungle. Thomas Mann, who left Germany in 1933 and became an Amer. citizen, pub. in 1948 *Dr Faustus*, perhaps his greatest N. Major N.s stressing human loneliness were written by Franz Kafka (*The Trial*, 1925, and *The Castle*, 1926). The same subject, though in a less despairing manner, was treated by Hermann Hesse. More recent Ger. novelists of importance include Werner Bergengruen, Edzard Schaper, Ernst Jünger, Hans Werner Richter, Heinrich Boll, and Walter Jens.

Soviet novelists are also circumscribed in their activities by the political outlook of the regime. Among the best-known of N.s of the revolution and civil war are Sholokhov's *And Quiet Flows the Don*, 1934—familiar to Eng. readers—and Alexey Tolstoy's *Darkness and Dawn*, 1935, a picture of the Russian intelligentsia during and after the First World War. Sholokhov's *Virgin Soil Upturned*, 1935, is a masterly presentation of peasant life. Kataev's *Forward, O Time*, 1934, is an example of the type of N. which purports to reflect the tempo of the Five-Year Plan. The N.s of Ilya Ehrenburg picture the unhappy Russian intellectual of the old type who cannot adjust himself to the new standards of objectivity.

The Second World War, apart from providing new material, did not greatly affect N. writing. New writers came to the fore and estab. ones produced new work. Among those deserving special mention are Graham Greene, a powerful writer on themes of a spiritual nature and great psychological insight (*Brighton Rock*, 1938; *The Power and the Glory*, 1940; *The Heart of the Matter*, 1948); Evelyn Waugh, who is chiefly a satirist (*Brideshead Revisited*, 1947); Ivy Compton-Burnett, Rosamund Lehmann, H. E. Bates, F. L. Green, Henry Green, and Storm Jameson (*The Moment of Truth*, 1949). The tendency of the younger novelists was a concern with the deeper realities of life rather than with manners, and the school of James Joyce and Virginia Woolf has not found a great following. Of the older generation W. Somerset Maugham is the doyen, a member of the realist school and of great technical skill (*Of Human Bondage*, 1915; *The Moon and Sixpence*, 1919; *Cakes and Ale*, 1930). He also, in *The Razor's Edge*, 1944, left the ironical social scene for a deeper theme. Aldous Huxley has been drawn towards a sort of eclectic mysticism, exemplified in *Time Must Have a Stop*, 1944, and Charles Morgan, leaving the philosophic heights of *The Fountain*, 1933, wrote scorching N.s on moral problems (*The Judge's Story*, 1948, and *The River Line*, 1949). Notable work has also been done by Elizabeth Bowen, Christopher Isherwood, Nigel Balchin, and Gerald Bullett. Other novelists prominent in the fifties were Joyce Cary, L. P. Hartley, Anthony Powell, and C. P. Snow, whose work *The New Men* was awarded the Tait Black Memorial Prize for the best novel of the year 1954. In the years immediately following, this ann. award went to Ivy Compton-Burnett for *Mother and Son* and

to Rose Macaulay for *The Towers of Trebizond*. See the separate articles on the authors named in the above section.

Of Fr. novelists, the most outstanding are André Gide, Georges Duhamel, François Mauriac, Roger Martin du Gard, Jules Romains, André Maurois, André Malraux, André Chamson, and Albert Camus (qq.v.).

THE AMERICAN NOVEL. The first professional Amer. novelist was Charles Brockden Brown (1771-1810), whose books were in the manner of the Gothic horror tales then popular in England. With Fenimore Cooper (1789-1851), author of *The Last of the Mohicans*, 1826, Amer. fiction turned to romance and adventure, themes which were to reach a high level with Herman Melville (1818-91) in his *Moby Dick*, 1851, and novels of the S. Seas. In 1850 appeared *The Scarlet Letter* of Nathaniel Hawthorne (1804-64), whose imaginative tales and fantasies give him a high place in Amer. literature, and 2 years later Harriet Beecher Stowe's *Uncle Tom's Cabin* became world famous. Bret Harte (1836-1902) and Samuel Langhorne Clemens (1835-1910), better known as Mark Twain, were both masters of fiction of a humorous or satirical type, while in the novels of Wm Dean Howells (1837-1920) what may be termed the classical Amer. novel reached its culmination. Henry James (1843-1916), a cosmopolitan rather than an American in his literary relationships, was one of the greatest masters of the psychological novel. In the nineties the cult of the red-blooded novel of adventure was carried on by the short-lived Stephen Crane (1871-1900) and Frank Norris (1870-1902), followed by Jack London (1876-1916), who lived in and wrote of the primitive; while historical romance was represented by such authors as Mary Johnston (1870-1936) and the Amer. Winston Churchill (1871-1947). At the beginning of the new cent. leading places were held by Edith Wharton (1862-1937), a professed disciple of Henry James, who like him handled social themes with cultivated restraint, and another follower of the same tradition, Willa Cather (1873-1947), who wrote of pioneering days in the W. frontier.

In 1900 the pub. of *Sister Carrie* by Theodore Dreiser (1871-1945) was symptomatic of a new vogue which disregarded the conventions and restraints of the previous cent. The sordid realism of this vigorous and unpolished writer brought him into collision with the censorship but also had a great influence on younger authors such as John Steinbeck (1902- ), whose *Grapes of Wrath*, 1939, deals with the problems of migrant labour; Erskine Caldwell (1903- ), who wrote of the depressed agricultural classes in *Tobacco Road*, 1932, and *God's Little Acre*, 1933; and James Farrell (1904- ), whose *Studs Lonigan*, 1937, is a sordid study of the Chicago slums. Less squalid pictures of Amer. life were drawn by Sinclair Lewis (1885-1951), whose *Babbitt*, 1922, was a brilliant satire on the Amer. business man, and who in 1930 was the first American to be awarded the Nobel Prize for Literature.

Upton Sinclair (1878- ), in his 'Lanny Budd' series of some 10 novels, 1940-53, made a fictional record of world history from 1913 onwards, and John Dos Passos (1896- ) has given a panorama of Amer. life in his trilogies *U.S.A.*, 1938, and *District of Columbia*, 1952. Scott Fitzgerald (1896-1940) wrote sev. witty and moving books on the post-war era, notably *The Great Gatsby*, 1925, and *Tender is the Night*, 1934. Often reckoned the greatest Amer. novelist of this cont. is Wm Faulkner (1897- ), who portrays Southern decadence in his tales of Yoknapatawpha Co., Mississippi, whose co. in Jefferson can be identified with the Amer. Oxford; in 1950 Faulkner was awarded the Nobel Prize for Literature, a distinction won by only 3 other Amer. novelists—Sinclair Lewis, mentioned above, Pearl Buck (1892- ), and Ernest Hemingway (1899- ). Pearl Buck has written a number of novels about China, of which *The Good Earth*, 1931, is the best known. Hemingway's *A Farewell to Arms* is one of the best books about the First World War, while his famous novel, *For Whom the Bell Tolls*, 1940, is based on the Sp. Civil War. Two writers who defy orthodox classification are James Branch Cabell (1879-1958), a satirist who wrote medieval fantasies round an imaginary kingdom he called Poitresme, and Thornton Wilder (1897- ), whose *Bridge of San Luis Rey*, 1927, set a new fashion in fiction. The cult of the mammoth novel in the thirties was well illustrated by Hervey Allen's *Anthony Adverse* and Margaret Mitchell's *Gone With the Wind*, which was the record best-seller of all time in America. A noteworthy development typical of America's literary self-consciousness has been the growth of the 'regionalist' N., which portrays characteristic aspects of life and culture in different regions of the U.S.A. The bleakness of the Middle W. as reflected in the N.s of Zona Gale (1874-1938) and the realist studies of Virginia in the work of Ellen Glasgow (1874-1945) illustrate this movement. Another byway of literary development is seen in the humorous fiction of Robert Benchley (1889-1945) and James Thurber (1894- ), who supports his inspired absurdities with his own drawings. See the separate articles on the authors named in the above section.

See also CHILDREN'S BOOKS; DETECTIVE STORY; HUMOUR; and under individual countries.

See J. Dunlop, *The History of Fiction*, 1814; Sir W. Scott, *The Lives of the Novelists*, 1825; D. Masson, *British Novelists and their Styles*, 1859; W. Forsyth, *Novels and Novelists of the Eighteenth Century*, 1871; E. Zola, *Les Romanciers naturalistes*, 1883; Sir W. Raleigh, *The English Novel (to 1800)*, 1894; W. L. Cross, *The Development of the English Novel*, 1899; G. Saintsbury, *The English Novel*, 1913; H. James, *Notes on Novelists*, 1914; G. von Lukács, *Die Theorie des Romans*, 1920; P. Lubbock, *The Craft of Fiction*, 1921; E. A. Baker, *The History of the English Novel*, 1924-39; G. Duhamel, *Essai sur le roman*, 1925; A. Thibaudet,

*Le Liseur de romans*, 1925, and *Réflexions sur le roman*, 1938; R. E. Prothero (Baron Ernie), *The Light Reading of our Ancestors*, 1927; W. Rehm, *Geschichte des deutschen Romans*, 1927; F. Mauriac, *Le Roman*, 1928; R. M. Lovett and H. S. Hughes, *The History of the Novel in England*, 1932; H. Hatcher, *Creating the Modern American Novel*, 1935; P. Henderson, *The Novel To-day*, 1936; P. Valéry and others, *Problèmes du roman*, 1943; A. Comfort, *The Novel and our Time*, 1948; W. van O'Connor, *Forms of Modern Fiction*, 1949; W. Allen, *Reading a Novel*, 1949; H. Gardiner, *Fifty Years of the American Novel, 1900-50*, 1951; R. Church, *The Growth of the English Novel*, 1951; M. Sadleir, *XIXth Century Fiction*, 1951; W. Allen, *The English Novel: a Short Critical History*, 1954, and *The Novel To-day*, 1955.

Novellae, see JUSTINIANUS, FLAVIUS.

Novello, Clara (1818-1908), soprano singer, daughter of Vincent N., b. London and trained in Paris. She made her first public appearance in England in 1833, and from then until her retirement in 1860 she was regarded as one of the greatest vocalists in concert, opera, and oratorio, both in England and on the Continent. See her *Reminiscences*, 1910, compiled by her daughter, Contessa V. Gigliucci.

Novello, Ivor (1893-1951), original name Ivor Novello Davies, b. Cardiff, son of Clara Novello Davies (1861-1943), Brit. singing instructor, choral conductor, and founder and conductor of the Royal Welsh Ladies Choir. N. first appeared on the stage in 1921, but had already won some success as a song writer, his *Keep the Home Fires Burning* being very popular during the First World War. His musical plays and revues include *Tabbs* and *The House that Jack Built*, and, as his own actor-manager, *The Rat* (written in collaboration with Constance Collier). His own plays include *The Truth Game*, 1928, and *Symphony in Two Flats*, 1929, while other plays which he acted in and managed were *Murder in Mayfair*, 1934, *Glamorous Night*, 1935, *Careless Rapture*, 1936, *Crest of the Wave*, 1937, *The Dancing Years*, 1939, *Perchance to Dream*, 1945, and *King's Rhapsody*, 1949. He also acted star parts in many films.

Novello, Vincent (1781-1861), Eng. musician of It. descent, b. London, where he held posts as organist from 1796 to 1822. He ed. the masses of Haydn and Mozart, the works of Palestrina, and other great music then unknown in England. He composed a vast quantity of sacred music, and with his pub. of the first vol. of his original work in 1811 laid the foundation of the publishing firm of N. & Co. He was the founder of *Musical Times*, and shared in the foundation of the London Philharmonic Society. See M. Cowden-Clark, *The Life and Labours of Vincent Novello*, 1863.

November, eleventh month of the year, derives its name from the Lat. *novem* (nine), as, until the Julian arrangement, it was the ninth month of the old Rom. year, which began in Mar. There are 30 days in the month; the 11th was considered by

the Romans as the beginning of winter, and the *epulum Jovis* (banquet of Jupiter), was held on the 13th.

**Noventium**, see CITTANOVA.

**Novgorod**: 1. Oblast in NW. Russia, with the lowland around Lake Il'men' in the W. and the Valdai upland in the E., half covered with mixed forests. It has lignite and peat deposits. There are lumbering and woodworking industries, peat extraction, and linen milling; old crafts are practised, and flax and dairy farming pursued. The area was the core of the vast terr. in northern Russia dominated by N. city in the Middle Ages. Area 20,700 sq. m.; pop. (1956) 718,000 (Russian).

2. Cap. and cultural centre of the above, one of the oldest Russian tns and a cradle of Russian statehood. It is situated 119 m. SE. of Leningrad, and has varied industries. N. is a treasury of Russian architecture of the 11th-18th cents. Extensive excavations have been made since 1929. The tn has been known since the 9th cent. According to Russian chronicles, the Varangian (Scandinavian) prince Rurik, invited by Novgorodians, came to N. in 862, and this year is traditionally considered to mark the foundation of the Russian state. Oleg transferred the cap. to Kiev in 882. N., which remained the main centre of foreign trade, obtained self-gov. from Yaroslav the Wise in 997, and achieved independence in 1136. The N. Rep. (officially styled 'Sovereign Great N.'), embracing the whole of northern Russia to the Urals, was governed by the chief officials of the city elected by the assembly of the townspeople (see VECH), with princes invited from other Russian centres as military commanders. Captured and annexed by Ivan III of Muscovy in 1478, N. retained its commercial position until the construction of St Petersburg. It became prov. cap. in 1727. N. suffered greatly during the Second World War (occupied 1941-4). Pop. (1956) 49,000 (in the 14th cent. allegedly 400,000).

**Novgorod-Severskiy**, tn in the Chernigov oblast of the Ukraine, on the R. Desna, 110 m. NE. of Chernigov. It has notable 11th-18th-cent. buildings. It has been known since 1096, was cap. of a principality, became Lithuanian in 1355, Muscovite in 1503, and Polish in 1618-67. Pop. (1935) 9,000.

**Novgorodtsev, Pavel Ivanovich** (1866-1924), Russian jurist and philosopher, prof. at Moscow (1903-18) and Simferopol' (1920-1) Univs., dean of the Russian Juridical Faculty in Prague (1922-4). He advocated the revival of the doctrine of natural law, stressing the independent validity of the moral evaluation of social and political events. His chief works are *The Historical School of Jurists*, 1897, *Kant's and Hegel's Teachings on Law and State*, 1902, *The Crisis of Contemporary Legal Consciousness*, 1909, *The Political Ideals of the Ancient and Modern World*, 1910, and *On the Social Ideal*, 1917. He ed. the symposium *Problems of Idealism*, 1903, which was a landmark in the hist. of Russian thought (see VEKHI).

**Novi**, or **Novi Ligure**, It. tn in Piedmont (q.v.), 13 m. SE. of Alessandria (q.v.). It has a ruined 14th-cent. castle, is an important centre of communications, and manufs. confectionery and ironware. Pop. 21,100.

**Novi Sad** (Ger. Neusatz), tn in Serbia, Yugoslavia, the cap. of the autonomous prov. of Vojvodina (q.v.). On the l. b. of the Danube, N. S. is a fine, modern tn, the seat of a bishopric, and a centre for the Hungarian minorities in Yugoslavia. For long called 'the Serbian Athens' because of the part it played in the cultural development of Serbia, it is to-day a busy riv. port, a road and rail junction, and an industrial and commercial centre. Pop. 83,200.

**Novice**, person who, after a period of probation as a postulant, is admitted to a religious order to be trained in the religious life, with a view to becoming a professed member of the order. The period of training, called the novitiate, varies in length with different religious orders.

**Novigrad**, see CITTANOVA.

**Novikov, Nikolay Ivanovich** (1744-1818), Russian journalist and publisher. A freemason, he endeavoured to improve social conditions and spread education. He pub. scv. periodicals and *The Library of Old Russian Authors* in 30 vols. He was imprisoned during the last years of Catherine II's reign.

**Noviodunum**, see NEVERS.

**Novochehkasck**, tn in the Rostov oblast of S. Russia, 33 m. NE. of Rostov-on-Don. It has an engineering industry (locomotives) and is a notable academic centre (Polytechnic Institute founded 1907; Zootechnic and Veterinary Institute founded in Warsaw 1840, evacuated, 1916; Don Cossacks Hist. Museum). N. was founded in 1805 as cap. of the Don Cossack Region. In 1917-20 it was one of the main centres of the anti-Bolshevik movement and the White armies, and cap. of the ephemeral Don state and SE. League. Pop. (1956) 90,000 (c. 1914, 67,000; 1926, 62,000).

**Novo-Georgievsk**, see MODLIN.

**Novo-Marinsk**, see ANADYR'.

**Novonikolayevsk**, see NOVOSIBIRSK.

**Novosibirsk**: 1. Oblast in W. Siberia stretching along the Trans-Siberian Railway, largely lowland with coniferous forests in the N., and steppe (see BARABA and KOLUNDA) in the S., traversed by the R. Ob' in the E. It has heavy (mostly engineering) and food industries, and wheat and dairy farming. The area was gradually annexed to Russia in the 16th-early 18th cents. Area 69,000 sq. m.; pop. (without N. city, 1956) 1,477,000, mostly Russians, also Ukrainians and some Tatars.

2. (until 1925 Novonikolayevsk) Cap., economic and cultural centre of the above, on the Ob' and the Trans-Siberian Railway, the largest city in Siberia and one of the main industrial centres of Russia, directly subordinated to the gov. of the Russian Federal Rep. It has large engineering (mining and electrical equipment, tools, agric. machinery) and varied

light and food industries. It is also a major transportation centre. It has a branch of the U.S.S.R. Academy of Sciences (1933), and sev. higher educational establs. N. was founded in 1893 in connection with the building of a railway bridge over the Ob'. Until 1930 it was developing as a commercial centre of the surrounding agric. area. Industrial development has taken place since the first Five-Year Plan and particularly since the Second World War. N. was the administrative centre of Siberia in 1925-30, and of W. Siberia in 1930-7. Pop. (1956) 731,000, ninth in the U.S.S.R. (1917, 69,000; 1926, 120,000; 1939, 406,000).

**Novosibirskiy Ostrova** (New Siberian Islands), group of Russian is. in the Arctic Ocean, NE. of the Lena Delta. Area 9650 sq. m. They include Koteln'y, Fadeyevskiy, New Siberia, Lyakhov (Lyakhov), and several smaller is. They are mostly uninhabited, except temporarily by hunters. Fur-bearing animals abound. Bones of the mammoth and other extinct animals have been found. Liakhov discovered the is. in 1770. Seven Soviet weather stations have been set up since 1928.

**Novo-Teherkassk**, see NOVOCHERKASSK.

**Novy Kolin**, see KOLIN.

**Nowa Sól** (Ger. Neusalz), tn of Poland, in Zielona Góra prov., on the Oder (q.v.), 13 m. SE. of Zielona Góra (q.v.). It has textile and paper industries. Pop. 7000.

**Nowra**, tn on Shoalhaven R., in New S. Wales, Australia, 95 m. S. of Sydney. It is the site of a large naval air station. Dairy farming is the prin. rural activity. Pop. 6000.

**Nowshera**, or **Naushara**, tn of W. Pakistan, 25 m. E. of Peshawar. It is from N. that the road and railway branch north to Dargai and the Malakand Pass.

**Nowy Port**, see GDANSK.

**Noyes, Alfred** (1880-1958), poet, b. Wolverhampton. He was educ. at Exeter College, Oxford, where he was notable as an oarsman. Encouraged by George Meredith, he devoted himself to poetry and succeeded in making a livelihood by it. His first vol., *The Loom of Years*, 1902, was followed by his popular sea epic, *Drake*, 1906-8. In 1913 he delivered the Lowell lectures in the U.S.A., taking as his subject 'The Sea in English Poetry,' and from 1914 to 1923 he was prof. of Mod. Eng. literature at Princeton. In 1918 he received the C.B.E. Later he returned to England and settled in the Isle of Wight, and in 1930 he was received into the Rom. Catholic Church. In his command of rhythm and melody N. belongs to the school of Tennyson, the sea and fairyland being his special provs. His epics *The Flower of Old Japan*, 1903, and *The Forest of Wild Thyme*, 1905, are the finest fairy poetry since the Elizabethans. His most famous works are *Drake*, *Tales of the Mermaid Tavern*, 1913, and *The Torchbearers*, 1922-30, an epic of scientific discovery. A single vol. of collected poems was pub. in 1950. He also wrote sev. plays and a book of critical essays, *Aspects of Modern Poetry*, 1924. *Two Worlds for Memory*, 1953, is an

autobiography. See study by W. C. Jerrold, 1930.

**Noyes, John Humphrey** (1811-86), founder of the Perfectionists (q.v.), b. Brattleboro, Vermont, U.S.A. He founded a community at Putney, in Vermont, the tenets of the sect being communism in everything, including marriage. The sect afterwards went to Oneida, New York, but N. found himself in difficulties owing to his free ideas with regard to marriage. He wrote *The Doctrine of Salvation from Sin Explained and Defined*, 1843, *The Berean*, 1847, and *History of American Socialisms*, 1870.

**Noyon**, Fr. tn in the dept of Oise, on the Verso. It was a bishopric from the 6th cent., and was one of the caps. of the Frankish kings. Here Charlemagne (q.v.) was crowned in 768, and Hugh Capet (q.v.) in 987. It has a splendid cathedral, partly 12th cent. The tn was damaged in both world wars. N. was the bp. of Calvin (q.v.). It has iron works and an agric. trade. Pop. 6200. See R. L. Stevenson, *An Inland Voyage*, 1878, and M. Aubert, *Noyon et ses environs* (Paris), 1920.

**N.S.D.A.P.**, abbreviation for *Nationalsozialistische Deutsche Arbeiter-Partei*, or Ger. Workers' party. See NATIONAL SOCIALISM.

**N.T.S.** (Russian abbreviation for *National Labour Alliance*, also known as *National Alliance of Russian Solidarists*), Russian political organisation aimed at the overthrow of the Communist regime by a popular revolution and the estab. of a free and democratic gov. Its programme advocates a semi-socialist welfare state with some corporatist features (a vestige of the early influence of It. Fascism). Founded by young émigrés in W. Europe in 1930, during the Second World War it worked underground in Ger.-occupied ters. of Russia and in the Vlasov (q.v.) movement. Since the war it has conducted revolutionary propaganda from abroad and by sending emissaries to Russia. Many N.T.S. members have been imprisoned in Nazi and Soviet concentration camps, and the Soviet security organs attempted to murder its present leaders, V. D. Poremskiy and G. S. Okolovich. In recent years the Soviet Gov. has repeatedly protested to foreign govts. for allowing N.T.S. activities on their ters.

**Nuba**, black aboriginal people dwelling in the SE. quarter of Kordofan (q.v.), Sudan, remarkably heterogeneous in physical type and language. They are pagans, living in autonomous groups under the control of their *meks* and rain-makers and observing the cult of the spirits of the dead. Their prov., the Nuba Mts, like certain other inland parts of the S. Sudan, is most difficult of access. The numerous rocky massifs, rising from the plain, are covered with thorny scrub and honeycombed with deep and intricate caves, and lie amid the swamps of the Upper Nile and Bahr-el-Ghazal riv. systems. There has been frequent trouble with the Nuba, and various punitive operations in the Nuba Mts have been due to one



or other of sev. causes or a combination of them, namely, inter-mt. feuds and pillaging forays, attacks on Arabs or police or travellers in the plains, and refusal to pay taxes or hand over captives to the gov. In 1928, in order to facilitate administration, the Nuba Mts prov. was amalgamated with Kordofan. See C. G. and B. Z. Seligman, *Pagan Tribes of the Nilotic Sudan*, 1932; Sir H. MacMichael, *The Anglo-Egyptian Sudan*, 1934; S. F. Dadel, *The Nuba: an Anthropological Study of the Hill Tribes in Kordofan*, 1947. Nubeculae Major and Minor, see MAGELLANIC CLOUDS.

those of Egypt, lacking Negro characteristics and resembling the Temehu, or Libyans, of the W. desert. Later the Libyans tended increasingly to settle in N. on the W. bank of the riv. By about 2000 BC the fusion of these races had produced a pop. resembling that of to-day in physical characteristics, while the rulers of Egypt had estab. garrisons and colonies in what is now Dongola prov. Under Sesostris, Pharaoh of the 12th dynasty, Kerma was rebuilt as one of the chief administrative centres of N., and it remained so till its destruction in 1600 BC. About 950 BC Libyans obtained



E.N.A.

#### NUBIA: THE TEMPLE OF ISIS, PHI LAE

A photograph taken after the creation of the Aswân Dam, which caused the partial submersion of the island and its famous buildings.

**Nubia**, tract of country, with no precise limit, in NE. Africa, anciently known as Ethiopia to the Greeks and as Kush to the Pharaohs and, broadly, lying between Egypt and the Gezira area. The ancients gave the name of Ethiopia to the W. bank of the Nile, from Meroë to the bend of the riv. The name may have been derived from the Egyptian and Coptic *Noub*, or Gold, a name still retained in Wady Nouba, which extends from the frontier of Dongola N. of the Wady Soboua, above Derri. The tract between Soboua and Aswân is called the Wady Kenous. The modern inhab. of N. consist principally of Arabs, who invaded the country after the rise of Mohammed, and merged with older races, the prin. tribes being the Djowahere and El Gharbye, who inhabit from Aswân to the Wady Halfa.

An Egyptian Gov. expedition of 1931, which was led by W. B. Emery, excavated the 5th- and 6th-cent. tombs of the Blennytes, at Qustul and Ballana. It seems that in the 4th millennium BC N. had been inhabited by a people identical with

control in N. and there founded an independent monarchy with its centre at Napata, near the holy hill of Barkal (in Dongola). Kashta, a Libyo-Sudanese, in the 8th cent. conquered Egypt as far as Thebes. In 600 BC a Nubian king re-occupied the Delta, but soon afterwards was driven out by Assurbanipal, and in 654 BC the Nubian dynasts had withdrawn beyond the cataracts. There they consolidated their power, and for 3½ cents. the Napatan kingdom prospered from the swamps of the White Nile to the Aswân cataract. About 300 BC the sovereignty passed to Meroë (q.v.). The appearance, shortly before the beginning of the Christian era, of the Rom. legions in Ethiopia ended in the destruction of Napata (23 BC) and henceforth the 2 kingdoms of Napata and Meroë were again united under the rule of Meroë after a period of internecine strife in Ethiopia during which the ruling house at Napata had regained some influence. But final disaster overwhelmed Meroë about AD 350 at the hands of the Ethiopian King of Axum.

From the 3rd to the 6th cents., when it was converted to Christianity, the S. part was a pagan and independent Nubian kingdom: it had been settled by the Blemmyes who inherited a great part of Merotic culture. Northern N. became converted to Christianity in the 6th cent. and a form of Christianity based on the foundations laid by Julianus and Longinus remained the official religion of N. until superseded by Islam 700 years later. It was probably in the 6th cent. that the tn of Dongola was founded and made his cap. by Silko, a convert who styled himself 'prince of the Nubians and all the Ethiopians.' In AD 641 the ruler of Egypt sent 'Abdulla ibn Sa'ad with 20,000 men to invade N., but they made no great advance and soon returned. A few years later 'Abdulla, as governor of Upper Egypt, again invaded N., destroyed Dongola, and concluded a treaty with the Nubians which subsisted for some 600 years of varied observance. About the middle of the 9th cent. the period of Arab domination in Egypt ended and the Mamelukes (q.v.) usurped power. The immediate result was that large numbers of Arabs migrated southwards and settled among the Nubians, and north of Halfa they won over a proportion of the Nubians to their faith, but further S. they made no impression. Little more is recorded of N. until, about AD 1200, it was visited by Abu Salih, the Armenian, who found that it contained 7 bishoprics, including one at Dongola. But under Beybars, the Mameluke imperialist, N. was laid waste. Henceforth it could offer but little resistance. The encroachments of the Arabs increased each year. Sultan after sultan sent armies to capture slaves and plunder. The Christian barrier set up in the 6th cent. now finally crumbled before the Arab hordes. In the 13th, 14th, and 15th cents. the northern and central regions of the Sudan fell to the Arabs, and those of the older inhab. who were not forced into the S. fastnesses became merged with the Arabs, thus evolving the characteristic type of the present day.

The part of N. between Aswân and Wady Halfa is called Lower N. and is under Egyptian jurisdiction; Upper N. belongs to the Rep. of the Sudan. The chief attractions of this country to travellers are the numerous temples and other anct remains of the Egyptians, extending from Philae to the Isle of Argo. These consist of the temple of Isis, in the Isle of Philae, founded by Nectanebo I, and continued by the Ptolemies; the temple of Deboud, built in honour of Amen Ra by Ataramen, and continued by the Romans; Tafa or Taphis, the modern Kalabshe, built by Rameses II; the rock temple of Beit e Welly, recording the conquests of the same monarch; Wady Halfa, built by Osertesen I; the rock temple of Isamboul, built by Rameses II; Gebel Addeh, built by Horus of the 18th dynasty; Ithrim, built by Amenophes II; Amada, founded by Thothmes III; Gherseh, Sebous, and Derri, built by Rameses II; Dakkeh, the anct Pselcis, built by Ergamenes; the Colossus of the

Isle of Argo; and the Pyramids of Meroë and Tanquassi. See also ETHIOPIA. See J. L. Burokhardt, *Travels in Nubia*, 1819; E. A. Wallis Budge (ed.), *The Egyptian Sudan*, 1907, and *Nubian Texts*, 1909; Sir H. MacMichael, *The Anglo-Egyptian Sudan*, 1934; J. and A. Hamilton, *The Anglo-Egyptian Sudan from Wilthn*, 1937; R. L. Hill, *A Bibliography of the Anglo-Egyptian Sudan from the Earliest Times to 1937*, 1939; W. B. Emery, *Nubian Treasure: an Account of the Discoveries of Ballana and Qustul*, 1948; J. Spencer Trimingham, *Islam in the Sudan*, 1949.

Nuble, inland prov. of central valley of Chile, immediately S. of lat. 36° S., and crossed by long. 72° W. Wheat, wine, timber, and cattle are produced. Its cap. is Chillán. Area 5487 sq. m.; pop. 251,607.

Nucellus, in botany, the part surrounding the embryo sac in the uniovular ovaries of a plant. The N. is a mass of tissue and the embryo sac embedded in it contains an abundance of protoplasm and a number of small cells. Surrounding the N. are an inner and outer integument or envelopes of ovule.

Nuceria, see NOCERA INFERIORE.

Nuclear Counters, see CERENKOV COUNTER; GEIGER-MUELLER COUNTER; SCINTILLATION COUNTER.

Nuclear Emulsions, special photographic emulsions sensitive to the passage of a charged atomic particle, e.g. a proton or alpha particle, or even an electron. Ordinary photographic plates can be blackened by alpha particles, but it was not until 1947 that the value of the method was made evident by the discovery of the pi-meson (q.v.) by Powell and Occhialini using improved emulsions. The track of the particle can be seen under a microscope after the emulsion has been processed and consists of a series of dark grains. The emulsions are often 0.4 or 0.6 mm. thick, much thicker than those of ordinary photographic films or plates, and are sometimes stripped from their glass backings and stacked together (with thin tissue interleaving) to form large blocks of emulsion (e.g. 14" × 10" × 5"). Complete high energy cosmic ray events can then be studied. The variation of the grain density and the small side to side deviations or scattering along the track enable the identity of the particle to be estab. See GEIGER-MUELLER COUNTER and WILSON CLOUD CHAMBER.

Nuclear Fallout, the precipitation under the action of gravity of the products of a large-scale nuclear reaction, such as the explosion of an atomic bomb (q.v.). These products are nearly all radioactive with half-lives ranging from fractions of a second to many years. The rate of precipitation and the area affected depend on the atmospheric conditions, but the major fallout is complete in sev. hours and the effects of single bombs have been detected over most of the surface of the earth. The hydrogen bomb (q.v.) with its more powerful explosion causes serious concern to many nations because of the increasing danger of N. F. with its effect on the health of people and animals.

The U.K. and the U.S.A. appear to have tested 'clean' bombs with only a few per cent of the fallout of the earlier types.

Once the short-lived radioactive products have decayed to a low level (after a few days), direct contamination of surfaces presents a small problem compared with that of inhalation and ingestion. Of the many elements involved only a few are considered to be highly dangerous at the levels of radioactivity usually encountered after a few days. Radiostrontium (Sr 90) has chemical properties similar to calcium and accumulates in bone. Its radiation may lead to various forms of cancer, including leukaemia. Because of radioactive decay and biological elimination the harmful radiation is reduced to one half of its original value in about 10 years. Radioactive iodine (I 131) with a half-life of about 8 days is normally a less serious danger. The abnormally large proportion of radioiodine released in the accident at Windscale (q.v.) was due to the exceptional circumstances. Most of the effects of radiation on the health of the individual are fairly well understood, but relatively little is known of the consequences to subsequent generations of the mutation of genes brought about by exposure to N. F. The genetic hazards are such as to demand a continued caution in the testing of nuclear weapons. See H. Heckstall-Smith, *Atomic Radiation Dangers*, 1958.

**Nuclear Power**, power produced from reactions involving the nuclei of atoms. At the present time the reactions used for power production are: (a) fission of the nuclei of some heavy elements, and (b) fusion of the nuclei of some light elements. The fission reaction has recently been employed for power production on a small scale in experimental N. P. stations in the U.S.A. and U.S.S.R., and on a commercial scale in the U.K. Calder Hall power station. So far as is known the fusion reaction has not yet been utilised for the controlled production of appreciable amounts of power. Its application has been limited to relatively uncontrolled releases of power, as in the hydrogen bomb.

**Importance.** The importance of N. P. may best be judged from a consideration of the predicted duration of the world's power resources. It is estimated that the existing economic fossil fuel reserves (coal, oil, etc.) will be exhausted in about 100-200 years. At this time the world would probably be dependent largely on hydro-electric power which with the greatest possible development would only account for a small percentage of the requirements. Assuming that no other power sources existed, civilisation in its present form would end. However, it is estimated that the resources of N. P. derivable from the fission process are about 100 times as large as the energy available from existing economic fossil fuel reserves. Moreover it is thought that the controlled fusion process utilising light elements will make available energy equivalent to 100 million times the present economic fossil fuel reserves. It is thus

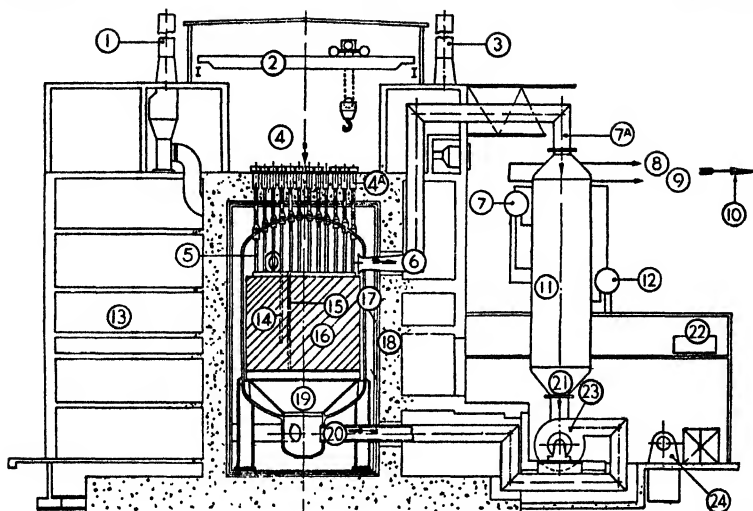
seen that the application of nuclear fission to power production has ensured that the world's power resources will be adequate for many cents. after the exhaustion of fossil fuel reserves, while the advent of a controlled fusion reaction would provide power reserves lasting for many millennia.

In the U.K., where coal production is not keeping pace with consumption, the importance of N. P. was recognised by the pub. of a Gov. White Paper in 1955 laying down a programme for the development of N. P. The programme was based on the existing ann. increase in power consumption of about 7 per cent, and indicated that N. P. stations of a capacity of 2 million kW. (about 5 per cent of the total capacity) would be required by 1965 to meet the deficit between power requirements and coal production. In 1957 this programme was revised and now requires the production of 6 million kW. by 1965.

**Power production from fission.** So far as is known all existing N. P. producers rely mainly for their energy source on the fission of uranium 235. Natural uranium contains largely 2 types of uranium, chemically similar, but of different atomic weights. The respective atomic weights of the 2 isotopes, as they are called, are 235 units and 238 units and the 2 types of uranium are known symbolically as U235 and U238. Natural uranium contains 140 times as much U238 as U235. A nucleus of U235 on being struck by a neutron, a nuclear particle with no electrical charge, may undergo fission. When this occurs the nucleus of the U235 atom is split, emitting a quantity of energy which ultimately appears as heat and also emitting, on the average, about 2.5 new neutrons. If it can be arranged that one of these newly emitted neutrons can cause a further fission of a U235 nucleus, and so on, then it is possible to achieve a chain reaction whereby the fission reaction becomes self-propagating and does not require any external energy source to enable the reaction to continue. This neutron induced chain reaction is utilised in N. P. plants, the heat emitted being utilised to raise steam which is then passed through conventional steam turbines driving alternators which produce electricity. The energy available in a given weight of U235 is equivalent to that produced by about 2 million times the weight of coal.

The other products of the fission reaction are the remaining fragments of the U235 nucleus, known as fission products, which are intensely radioactive and can cause damage to health if they are not carefully shielded and stored.

The U238 which is usually present in reactors absorbs neutrons, and some is eventually converted to plutonium, which is a fissionable material somewhat similar to U235. Plutonium can probably be used for fuelling future reactors, and it is the value of the plutonium which helps to make the cost of N. P. production competitive with conventional methods. Normally the stock of fissionable material in a reactor is decreasing, as not enough



United Kingdom Atomic Energy Authority  
CROSS-SECTION OF A CALDER HALL REACTOR, SHOWING THE PRESSURE VESSEL  
AND ONE OF THE HEAT EXCHANGERS

- |   |   |
|---|---|
| 1 and 3. Chimney for cooling air.                         | 13. Control and switchgear block.                   |
| 2. Overhead crane.  | 14. Control rod.                                    |
| 4. Control charge face.                                   | 15. Uranium rods.                                   |
| 4A. Charging tubes.                                       | 16. Graphite moderator.                             |
| 5. Control rods.  | 17. Thermal shield.                                 |
| 6. Hot gas duct.  | 18. Biological shield.                              |
| 7. High-pressure steam drum.                              | 19. Pressure vessel.                                |
| 7A. Hot gas.  | 20. Cool gas duct.                                  |
| 8. High-pressure steam.                                   | 21. Cool gas.                                       |
| 9. Low-pressure steam.                                    | 22. Overhead crane.                                 |
| 10. Steam to conventional steam turbine generating plant. | 23. Electrically driven coolant circulating blower. |
| 11. Heat exchanger.                                       | 24. Motor generator.                                |
| 12. Low-pressure steam drum.                              |   |

plutonium is produced to compensate for the U235 which has been fissioned. By the use of the so-called fast reactor it is possible with careful neutron economy to produce plutonium more rapidly than the U235 is fissioned, a process known as breeding. Breeding makes it possible to convert virtually all the fertile U238 to plutonium and thus to increase the reserves of fissionable material by a factor of 100.

Basically there are 2 types of reactors, termed thermal and fast reactors. The fast reactor utilises neutrons at or about the fast speeds with which they are emitted in the fission process. In the thermal reactor the fast neutrons emitted in fission are slowed down to thermal speeds, that is to speeds equivalent to the normal velocities of the molecules of the material through which they are passing. The molecular velocity is, of course, proportional to the temp. of the material, hence the use of the term thermal velocity. This slowing down

process is carried out by means of a moderator, often made of graphite of high purity. The slowing down of the neutrons increases their chances of causing fission and is an essential operation in a natural uranium reactor. The fast reactor on the other hand does not require a moderator but does require a higher percentage of U235 than is available in natural uranium. The fast reactor, because of the absence of a moderator and the high concentration of fissionable material is considerably smaller in dimensions than the thermal type. At this stage it is only the thermal reactor which has produced power on a commercial scale, fast reactors still being in the experimental stage.

Control of reactors is achieved by varying the number of neutrons available in the reactor core. In the thermal reactor this is done by means of movable control rods made from non-fissile materials having good neutron absorbing properties, such as boron or cadmium. Fast reactor control usually requires either that the

neutron leakage should be a controllable variable or that a portion of the fissile material can be withdrawn, or inserted, as required. Any reactor control system is designed so that it will 'fail to safety' and hence in the event of any fault the reactor will be shut down and power production will virtually cease.

A diagrammatic cross-section of a Calder Hall thermal reactor is shown on page 332.

**Power production from fusion.** So far as is known the fusion reaction, involving the fusion of the nuclei of various light elements with the production of helium and heat, has only been used on a large scale in the hydrogen bomb. This reaction requires the existence of temps. of about 10,000,000° C. and, apart from the sun, it is only in the hydrogen bomb, which itself is probably initiated by a fission bomb, that such temps. are realised. However, there would appear to be little doubt that the problems inherent in the controlled fusion reaction will be overcome, and the vast global reserves of light elements will become available to mankind as a fuel. See ZETA.

**Nucleus** (Lat. *nucleus*, kernel; cf. *nux*, nut): 1. *Astronomy*: the name given to the central portion of a comet (q.v.). It is now thought that the diameters of the nuclei of comets have been greatly exaggerated, and in many cases 'central condensation' is a better description than 'nucleus.'

2. *Biology*: A N. is usually a spherical or ovoid body present in most living plant and animal cells, and playing a vital role in their activity. Among other things, it contains the *chromosomes* (q.v.) which carry the genes (q.v.) or unit characters of heredity. See CELL and HEREDITY.

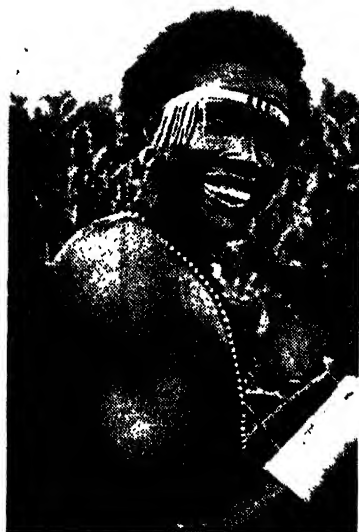
**Nucleus, Atomic.** The existence of a 'unit' more fundamental than the atom was revealed by the experiments of J. J. Thomson in 1895, on the conduction of electricity through highly rarefied gases. This unit, named the electron (q.v.), was found to carry a negative charge of electricity, and was a constituent of every atom. The net charge on a whole atom being nil, it was theoretically evident that there must also be a unit carrying a positive charge of electricity in the make-up of an atom. The products of the spontaneous disintegration of radioactive atoms confirmed this conclusion, for while the  $\beta$ -particles (q.v.) were found to be fast electrons, the  $\alpha$ -particles (q.v.) were found to carry positive charges. The general nature of each and every atom was finally discovered by Rutherford and his collaborators by the remarkable experimental method of firing  $\alpha$ -particles into atoms. Approximately 1 in 10,000  $\alpha$ -particles was deviated, and the surprisingly large number scattered through angles greater than 90 degrees indicated that the positively charged component occupied an exceedingly minute portion of the space taken up by the atom, and that the atom consisted very largely of empty space. Exact computations led to the conclusion that every atom consists of a minute though relatively massive N. of

diameter about  $10^{-13}$  cm. carrying a positive charge, and performing the function of the sun of a 'solar system' in which the planets are the electrons revolving rapidly in their distant orbits of radius about  $10^{-8}$  cm. Since the atom as a whole is neutral, the positive charge on the N. is exactly equal to the sum total of the charges on the planetary electrons. Further, the chemical and physical properties of an element were shown to depend on the charge on the N. of its atom. The charge on the N. was determined by Chadwick in 1920 from the scattering of  $\alpha$ -particles, using Rutherford's theory. This confirmed the interpretations of Moseley's work (1913) on X-ray spectra from which the nuclear charge had been deduced. Evidence provided by the disintegration of radioactive atoms, supported by further experiments of Rutherford and Blackett, led to the conclusion that atomic nuclei have a complex structure. By bombarding nitrogen atoms with  $\alpha$ -particles, Rutherford (1917) showed that it is possible to break up these nuclei, that they then emit protons (q.v.), an atom of a heavy isotope of oxygen being formed. Later work showed that other atoms when bombarded with  $\alpha$ -particles emit neutrons—particles which are electrically neutral, and have masses nearly equal to those of protons. The simplest atom, that of hydrogen, has a N. consisting of 1 proton, round which a solitary electron revolves in a distant orbit. The atom of the next element, helium, has a N. consisting of 2 protons and 2 neutrons; it thus has a net positive charge equal to that of 2 protons, so that there are 2 planetary electrons. The heaviest naturally occurring atom, that of uranium, has no fewer than 92 electrons describing orbits round a N. having a net positive charge equal to that of 92 protons. Now the mass of an electron is very small, being about 1/1839 of the mass of the proton. Hence the mass of an atom is largely concentrated in its N., and it might appear from the above that the helium atom would have 4 times the mass of the hydrogen atom and likewise that the mass of any atom would be a simple multiple of that of the hydrogen atom. This is only approximately true, and it is found that the mass of any atom is always less than that expected by adding up the masses of the individual protons and neutrons. As is shown by their radioactivity certain types of atomic nuclei are unstable, and disintegrate spontaneously with the emission of a relatively light component such as an electron or  $\alpha$ -particle. A few of the heaviest nuclei (e.g. those of uranium) disintegrate in a different way when bombarded by neutrons, breaking down into 2 parts with roughly equal masses together with a few lighter particles. These processes of nuclear fission lead to the release of much greater amounts of energy than do ordinary radioactive changes, and have been used in atom bombs (q.v.). See also ATOM AND ATOMIC THEORY; ATOMIC BOMB; HYDROGEN BOMB; NUCLEAR POWER; RADIOACTIVITY; TRANSURANIC

**ELEMENTS.** See E. R. Rutherford, Sir J. Chadwick, and C. D. Ellis, *Radioactive Substances and their Radiations*, 1930; E. da C. Andrade, *The Atom and its Energy*, 1947; S. Glasstone, *Sourcebook of Atomic Energy*, 1952; R. D. Evans, *Atomic Nucleus*, 1955.

Nudd, see LUDD.

**Nueces**, riv. of Texas, U.S.A. It rises in Edwards co., and flows into Corpus Christi Bay, Gulf of Mexico, after a southerly and south-easterly course of 315 m. It contributes largely to irrigation, draining an area of 19,000 sq. m.



From E. E. Evans-Pritchard: *The Nuer* (Clarendon Press, Oxford)

#### A NUER YOUTH

**Nuer**, Nilotic Negro tribe of the S. Sudan. The N. inhabit the swamp region on both sides of the White Nile S. of its confluence with the Bahr-el-Ghazal, and their ter., estimated at 26,000 sq. m. in area, lies between that of the Shilluk (q.v.) and that of the Dinka (q.v.). The Nuer pop. is about 200,000. In 1917 Brit. troops went into the Nuer country, and in Feb. 1928 the N. took to the swamps but were bombed out by the R.A.F. and surrendered. They are transhumant pastoralists with many cattle, but with scattered permanent villages. The tribal organisation is based on a clan and lineage system. There is no king or chief, only certain ritual functionaries known as 'leopard-skin chiefs'; there were also 'prophets' who were deposed by the gov. Initiation by forehead-scarring is

practised. Kwoth is the name for God, who is associated with the firmament, but the word also denotes any spirit except 'ghost.' When the 'sons of Kwoth' or 'sky-spirits' enter into a man he becomes a prophet. These sky-spirits are associated with certain natural phenomena or human relations in much the same way as the gods of classical or Norse mythology. The N. have been fully described by E. E. Evans-Pritchard, *The Nuer*, 1940, *Kinship and Marriage among the Nuer*, 1951, and *Nuer Religion*, 1956.

**Nueva Esparta**, state of Venezuela, comprising Margarita, Coche, and other is. There are pearl fisheries, and, at Puerto Formin, important magnesite workings. The cap. is La Asunción. Pop. 75,900.

**Nuevo Laredo**, port of entry into N. Mexico on the Rio Grande, opposite Laredo, Texas, on the Inter-Amer. Highway. Cattle and cotton are raised in the dist., and some industries, including cotton textiles and soap-making, are carried on. Pop. 29,000.

**Nuevo León**, industrial state of Mexico in the N. part of the rep., stretching from the Amer. border 300 m. S. to the tropic of Cancer. It is practically all mountainous. Monterrey, the cap., is a city of some 333,000 inhab., entirely surrounded by mts. From Monterrey there is a railroad to Laredo, another to the port of Tampico, and another to Matamoros on the Amer. frontier. The natural resources are silver, lead, copper, gold (in small quantities), and oil (not yet developed). Manufs. include beer, iron and steel, glassware, furniture, cotton goods, shoes, and enamel ware. Area 25,136 sq. m.; pop. 740,190.

**Nuevo San Salvador**, see SANTA TECLA.

Nuffar, see NIPPUR.

**Nuffield**, William Richard Morris, 1st Viscount (1877- ), motor manufacturer and philanthropist, b. Worcester, and educ. at Cowley vil. school, near Oxford. He began business as a cycle-maker and repairer in a shed at Cowley, and later made motor-cycles. N. built his first motor-car in 1911, and, a year later, opened a car factory. The first 'Morris Cowley' assembled not many years before the First World War, was a challenge to the whole Brit. motor market. At that time Brit. motor-cars were not in favour, almost the only reliable machine being a monopoly of the rich. Morris (as he then was) cut his selling price and offered a dependable car at £165. To do this he had to open a new factory at Cowley, which had now become a township housing hundreds of his employees. The First World War brought a temporary halt to the enterprise, and in that period N. made mine-sinkers. After the war he made cars on mass-production principles. By 1925 the Cowley works were producing 50,000 cars annually. In 1938 the factories covered 120 ac. and employed 16,000 persons. Just before the Second World War N. celebrated the sale of the millionth Morris car. His business was expanded by the purchase of the assets of Wolseley Motors Ltd for £730,000 in 1927 and by the absorption of the Riley

business. His success has been phenomenal, and he will be remembered also as a philanthropist. By 1938 he had given £11,500,000 for research, education, and charity, including £3,128,000 to Oxford Univ. alone, where he founded 4 medical professorships in 1937. Subsequently he made a gift of no less than £10,000,000 to found one of the biggest charitable trusts ever conceived. This, the N. Foundation, will derive an ann. income of £400,000 to be devoted to medical research, the development of medical and health services, trade and industrial research, social studies, and the care and comfort of the aged. By 1943 he had presented out of his private purse something approaching £26,000,000. He was created baronet in 1929, baron in 1934, and viscount in 1938, and received honorary M.A. and D.C.L. degrees from Oxford Univ.

**Nuffield College**, research college of Oxford Univ. endowed by Viscount Nuffield (q.v.) in 1937. The college is under the control of the Hebdomadal Council and comprises full-time official fellows conducting research, faculty fellows already holding offices in the univ. or the colleges which would qualify them to assist in its work, and visiting fellows competent to further its researches by virtue of their experience in the professions or in industry or commerce. In addition there are a number of resident post-graduate students receiving emoluments apart from Ad Souls. N. C. is the only college in Oxford which is not primarily for teaching. In June 1958 it received a royal charter of incorporation.

**Nugent, James** (1822-1905), philanthropist, b. Liverpool. In 1872 he founded the Catholic Total Abstinence League of the Cross, which had many branches both in Great Britain and America. He also estab. the 'Save the Boy' refuge and a Magdalen home.

**Nugent, Sir Richard**, 15th **Baron Delvin** (1583-1642), Irish soldier. He took part in the rebellion of the Earls of Tyrone (q.v.) and Tirconnell, and was imprisoned in Dublin but succeeded in making his escape. He was pardoned by James I, and was created Earl of Westmeath (1621).

**Nuichwang**, see NEWCHWANG.

**Nuisance** in law is either public or private. Although the distinction is difficult to define, it may be said to be the extent to which the convenience of the general public is affected. *Public nuisance* is an unlawful act or omission which causes or is liable to cause inconvenience or interference with the normal state of order and comfort of the public. Public N.s. are indictable (see INDICTMENT) as misdemeanours. Examples are: (1) obstruction of public highways by causing unnecessary crowds to assemble or pitching rubbish on to a road; (2) pollution of rivers with refuse; (3) exposing persons lawfully on the highway to the risk of injury from adjacent dangerous structures; (4) the carrying on of offensive or dangerous trades whose smells or noises interfere with public health and comfort; (5) disorderly houses; (6) a varied class of acts

judicially held to be public N.s. such as eavesdropping and publicly exposing persons inflicted with infectious diseases.

A public N. can also give rise to a civil action for injunction or damages at the suit of an individual who must, however, show that he has suffered some special damage greater than that caused to the general public.

*Private nuisance* is an unauthorised act or omission which interferes with the reasonable enjoyment of land or of some interest in land. N. may cause material damage to property itself, infringe the exercise of some right over it, or impair the health or comfort of a person occupying property. Examples of private N.s. are: (1) acts infringing the enjoyment by an owner or occupier of property, e.g. flooding by the diversion of a watercourse, vibration caused by machinery, overhanging branches or undergrowing roots of trees, undermining by excavation; (2) acts continuously affecting the health or comfort of the occupier of property, e.g. excessive noise or odious smells; (3) acts infringing the exercise of rights over land, e.g. the pollution of waters over which another has fishing rights, the obstruction of rights of air, light, or way. Long acquiescence in the N. may deprive the complainant of his remedies. On the other hand, the existence of a N. prior to his acquisition of property will not necessarily bar a new owner from relief merely because he has 'come to the N.' The test as to what constitutes a N. is usually 'the character of the neighbourhood and the pre-existing circumstances' (e.g. fumes from a chemical works would constitute a N. in a predominantly residential area, but not in an area where industrial processes have been carried on for some time on a large scale).

Damages may be awarded for N. The prin. and most effective remedy is an injunction (q.v.) to abate it (e.g. a court order to restrain noise or the blockage of a right of way). A local sanitary authority may order an offender to abate a public N. within a specified time; if the order is ignored, the authority can itself remove the N. and recover expenses and penalties. For text-books see TORT.

**Nukualofa**, tn on the N. coast of Tongatabu, cap. of the kingdom of Tonga.

**Nukunono**, see TOKELAU.

**Nulla poena sine lege**, i.e. no penalty can be imposed on a person found guilty of a crime unless it is explicitly provided for by law. This legal principle and its correlative, *nullum crimen sine lege* (no act is a crime unless it is so defined by law), were applied in the consideration of atrocities committed by the central powers during the First World War and of new crimes which science made possible committed by belligerents in the Second World War. See CRIMES, WAR.

**Nullification**, in the hist. of the U.S.A., a term used to denote the action of a state for rendering null and void any Act of Congress, or Federal Act, regarded by the state as unconstitutional. The application of the doctrine of N., or, more fully, N. and secession (i.e. from the

Union), received its strongest expression in S. Carolina in 1832, during the agitation against the notorious Tariff Act of 1828, which imposed excessive duties on raw material and imported manufs., and which has ever since been known as the 'Tariff of Abominations.' The S. Carolina 'Nullifiers,' having obtained no relief from Congress up to 1831, inaugurated a campaign for the calling of a state convention to nullify the tariff. This policy at once split the whole country into 2 factions—the 'Nullifiers,' or the 'State Rights and Free Trade Party,' and the 'State Rights and Union Party.' Congress then made various concessions by amending the Tariff Act. But the antipathy of North and South was too deep for the Nullifiers to win in the long run, and later a compromise was effected and the Ordinance of N. repealed. The doctrine of N. is no longer a rated principle. The civil war settled for all time the right of a state to withdraw from its contract with the Union. See *The Cambridge Modern History*, vol. vii, 1905.

**Nullity of Marriage**, a decree of N. of M. may be petitioned for by a man or woman on any of the following grounds: the fact of a former undissolved marriage; impotency of either of the 2 parties; relationship of the parties within the prohibited degrees of affinity; marriage without licence or pub. of banns; force, fraud, or mistake; wilful refusal to consummate; venereal disease or pregnancy by some third person existing at the time of marriage on the part of the person against whom the decree is sought. In 1956 a Royal Commission on Divorce suggested certain changes in the law of N. of M.

**Nullum crimen sine lege**, see **NULLA POENA SINE LEGE**.

**Numa Pompilius**, 2nd King of Rome, who belongs to legend rather than to hist. He was a native of Cures in the Sabine country; was elected king one year after the death of Romulus. His reign is supposed to have lasted from 715 to 673 bc. He was instructed by the *camena* or water-nymph Egeria, who visited him in a grove near Rome, and who honoured him with her love. N. P. was considered as the author of Rome's religious worship. He founded the temple of Janus, which remained always shut during his reign.

**Numantia**, anct tn of Hispania Tarraconensis. It commanded a position of great natural strength, being situated on a steep hill. In 134 bc it was besieged by the Romans under Scipio Africanus the Younger, and capitulated after a resistance of 15 months. The tn was razed to the ground, and the few survivors were sold as slaves. The title 'Numantinus' was given to the victor Scipio. The vil. of Guarray marks the site of the anct tn. Excavations of 1905-10 revealed the Rom. entrenchments and 13 camps. See A. Schulten, *Numantia* (4 vols.), 1914-31.

**Number of the Beast**, see **APOCALYPTIC NUMBER**.

**Number Sequences**, see **SERIES**.

**Numbers**, see **NUMERALS**.

**Numbers**, *The Book of*, forming the fourth book of the Pentateuch (q.v.), deals

with the travels of the Israelites from the second to the fortieth year of the Exodus. It also contains various collections of laws, e.g. in chs. v and vi. The institution of the Levites and the priestly duties receive much attention (chs. iii, iv, viii, xviii). See commentaries by L. Elliott-Binns, 1927, and P. Heinisch, Bonn, 1936.

**Numbers**, *Theory of*. This science consists of the investigation of the properties of whole or integral N., all incommensurable N. being excluded. It may be considered as including the investigation of rational fractions. An idea of the problems confronting the theory may be obtained by considering indeterminate equations. If a given equation contains 2 or more unknown quantities it is called *indeterminate*, i.e. no definite solution to the equation is possible (see **DIOPHANTINE EQUATIONS**). This also applies to the case of sev. equations, the total number of equations being less than the total number of unknown quantities contained in them. The problem in the theory of N. is to find every possible solution in which the unknown letters are integers. Sev. interesting properties of integers are proved by this theory. It is easily proved that the number of primo N. is infinite. The problem of finding in how many ways a composite number, i.e. a number which is divisible by N. other than itself and unity, can be resolved into 2 factors, is solved generally. It also proves that the product of  $n$  consecutive N. is divisible by  $n!$ , i.e.  $n(n-1)(n-2) \dots 1$ , thus  $20 \times 21 \times 22 \times 23$  is divisible by  $4!$ , i.e.  $4 \times 3 \times 2 \times 1$ . Sev. other important properties are proved, among which Fermat's theorem is perhaps the most important. This states that if  $p$  is a prime number, and  $N$  is a positive integer prime to  $p$ , then  $N^{p-1} - 1$  is a multiple of  $p$ . The interest of this branch of algebra is purely theoretical. The data of practical applications of mathematics are in the nature of things only approximate, and thus any solution given in whole N. is of very little interest. The first consideration of the theory probably took place in India, but the first book on the subject was written by Diophantus in his *Arithmetica*, the theory sometimes being called Diophantine Analysis. For further reading the most interesting books are Legendre's *Théorie des nombres*, while the beginner will find a suitable introduction to the subject in such standard works on algebra as Hall and Knight's *Higher Algebra*. For more advanced treatment and extension of the subject to algebraic N. see L. E. Dickson, *Theory of Numbers*, 1930; for the general principles of number see G. H. Hardy, *Pure Mathematics* (10th ed.), 1952.

**Numea**, see **NOUMÉA**.

**Numerals**. A numeral is a sign employed to express a number. It has long been recognised that the N., inaccurately termed 'Arabic' N., which nowadays are commonly used in daily life are of comparatively recent origin. Counting is nearly as old as speech and the N. are as old as writing. In anct times, and in some instances down to modern times,



each language had its series of N. Thus the number of systems of notation employed was about the same as the number of written languages, and in some cases a single language had sev. systems. The Egyptians, for instance, had 3 systems of N., respectively for the hieroglyphic, hieratic, and demotic scripts (q.v.). The Greeks had 2 systems of numerical notation, and the Romans frequently changed their numerical symbols. The great majority of the numerical systems are based on 5 or some multiple of 5, but there are traces of systems based on 4 (the Nabataeans had a sign for 'four'; the number 'eight,' 'acht,' 'octo' = Sanskrit *as-tau* = 'two fours'); the duodecimal system (which has left its traces in 'dozen,' 1 ft = 12 in., etc.) combined with 5 has given the hexagesimal system employed in Egypt and, especially, in Mesopotamia. The Maya and Aztec systems of notation were based on 20, and curiously enough the Fr. preserve traces of an ancient vigesimal system, perhaps of the Celts, in the numbers *quatre-vingts*, *quatre-vingt-dix*, *soixante-dix*. Nowadays numerical notation is mainly based on 10. Thus on the whole there are 4 main systems: the quaternary (based on 4), the quinary (based on 5), the decimal (based on 10), and the vigesimal (based on 20). To these, 2 secondary systems may be added: the pair system (still found amongst some primitive tribes of S. America, Australia, Indonesia, and Africa) and the hexad system (based on 6) with some traces in Africa. In the list, of N. 5 main categories can be distinguished.

**The Primitive Pictographic Notation.** The number is given by repetitions of the symbol representing the object in question, e.g. '5 men' is represented by the symbol 'man' repeated 5 times; this notation system is often found in pictographic documents of N. Amer. natives. Many primitive tribes represent the N.

40; 'one of the other hand,' 6; 'foot one,' 11; 'foot two,' 12; and so forth. In some Eskimo dialects the word 'man' also means 20, and 'two men,' 40.

**The 'Hieroglyphic' Systems of Numerical Notation** consisted of repetitions of a single unit, with the use of hieroglyphics for higher numbers, and sometimes introducing the principle of multiplication when repetitions become too many for practical use. (For the Egyptian N. see under **HIEROGLYPHIC AND HIERATIC WRITINGS, Numbers.**) In the cuneiform (q.v.) Babylonian system, the numerical notation for small numbers was quite simple; 1 was represented by a short, straight, vertical stroke, or rather wedge. 2 to 9 by two to nine short strokes, 10 by an angle, and 100 by a short vertical wedge followed by a short horizontal wedge. Sometimes 10 was represented by a vertical crossed by a horizontal stroke, 20 by a vertical crossed by two horizontals, etc., and the units were represented by horizontal and not vertical strokes. The tens were sometimes represented by circles, and the units by a kind of crescent. In larger numbers, which were not standardised, the vertical stroke also stood for 60, 3600, and in general for 60 to the *n*th degree. The angle also stood for  $10 \times 60$ ,  $10 \times 3600$ , etc., i.e. for  $10 \times 60$  to the *n*th degree. The value to be taken entirely depended upon the context; 3600 was sometimes represented by a kind of irregular square consisting of 4 short oblique strokes; the same symbol with a small angle inside denoted  $(3600 \times 10)$  36,000; and with 2 similar angles, 72,000. In the ancient Cretan script a stroke represented the unit; a dot, 10; a longer stroke, 100; a lozenge, 1000; at a later stage the units were represented by upright lines, the tens by horizontals, the hundreds by circles, the thousands by circles with four spurs, and the ten thousands by similar signs with a dash in the middle.

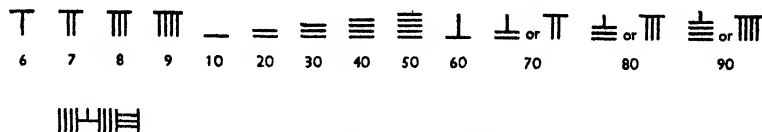


FIG. 1. CHINESE 'ROD' NUMERALS

a, numbers 6 to 90; b, the number 46,431 in monogram form.

by the repetition of the vertical or the horizontal stroke, 1 by one stroke 2 by two strokes, etc.; such tribes have little need for or interest in numbers of any considerable size. The primitive tribes of New S. Wales have but 4 numerical words in their vocabulary: 'one,' 'two,' 'three,' and 'many.' In various primitive forms of speech the number 5 is expressed by the word 'hand' or 'the hand finished,' 10 by 'two hands' or 'two hands finished,' in some primitive S. Amer. dialects 'all the fingers' means 10; 'all the fingers and toes,' 20; 'fingers and toes of two men,'

The Chinese had, and still have, various numerical systems. The 'rod' N. are quite simple; the units 1 to 5 consist of one to five vertical strokes; 6 to 9 of one to four vertical strokes with superscribed bar; and the tens of horizontal strokes or of a combination of horizontal and vertical strokes (see Fig. 1a). The hundreds were written like the units and so on. These N. were frequently written in the monogram form (see Fig. 1b). In the present Chinese system there are signs for the numbers 1 to 9 (1 to 3 consisting of one to three horizontal strokes,

for 10, 100, 1000, and 10,000. The number 25,647, for example, may be written either from the top downwards or from left to right, as follows: 2 (10,000's), 5 (1000's), 6 (100's), 4 (10's), and 7; or also the symbol 2 followed by the symbol 10,000, the symbol 5 followed by the symbol 1000, the symbol 6 followed by the symbol 100, and so on. Apart from the 'rod' system, the Chinese have 3 general systems of N.—the ancient national, the modern national (with the 'place-value,' and the circle used as 'zero'), and the commercial.

The Maya and Aztec numerical systems were vigesimal, and they wrote 20 as we write 10, using their characters for 20 and zero. In the Maya system 1 to 4 were represented by dots; 5, 10, 15, by sticks, lines, or bars, and 20, perhaps, by the moon. The symbols for the multiples of 20 (400, 8000, 160,000, etc.) are still uncertain; it may be, however, that they had the 'place-value' notation. In the Aztec system 1 to 19 were represented by dots or circles, 20 by a religious banner, 400 (20 × 20) by a pine tree, 8000 (20 × 20 × 20) by an incense-pouch. The most important feature of the Maya system was their zero, the importance of which was recognised by the Maya many cents. before any other people in the world; this symbol was similar to a shell, having numerous variants. The highest number found in a Maya inscription is 1,841,639,800 days, corresponding to over 5,100,000 years.

*The Alphabetical Systems.* The Jews, like the Syrians, the Arabs, and some other peoples, used the letters of their alphabet for numerical symbols, taking the first letter for 1, the second for 2, the tenth for 10, the eleventh for 20, and so forth, the last one (the 22nd) denoting 400. In the Talmud the numbers above 400 are formed by composition (500 = 400 + 100; 900 = 400 + 400 + 100); in later times the final forms of the letters *k, m, n, p, q* were

א	ב	ג	ד	ה	ו	ז	ח	ט	י
1	2	3	4	5	6	7	8	9	10
כ	ל	מ	נ	ס	ע	פ	צ	ק	
20	30	40	50	60	70	80	90	100	
ר	ש	ת	י	כ	ל	מ	נ	ס	ע
200	300	400	500	600	700	800	900		

FIG. 2  
HEBREW NUMERICAL SYSTEM

respectively used for 500, 600, 700, 800, 900. The later Hebrew numerical system is shown in Fig. 2. The thousands were represented by the same letters as the units, sometimes followed by a kind of apostrophe.

The Greeks used the letters of their alphabet for numerical notation in the same way as did the Jews. Since they had 24 letters in their classical alphabet, and

for a more satisfactory system of N. they needed 27 letters, they retained the ancient N.-Semitic-Gk letters *digamma* (as 6), *koppa* (as 90), and *sampi* as 900. Originally the capital forms were used; at a later stage the minuscules were employed. To distinguish the N. from letters a bar was commonly written over each number ( $\bar{\alpha}$ ), but sometimes the letter was written as if lying on its side ( $\epsilon$ ). The thousands

$\alpha$	$\beta$	$\gamma$	$\delta$	$\epsilon$	$F$	$\zeta$	$\eta$	$\theta$
1	2	3	4	5	6	7	8	9
$\iota$	$\kappa$	$\lambda$	$\mu$	$\nu$	$\xi$	$\omicron$	$\pi$	$\varsigma$
10	20	30	40	50	60	70	80	90
$\rho$	$\sigma$	$\tau$	$\upsilon$	$\phi$	$\chi$	$\psi$	$\omega$	$\nearrow$
100	200	300	400	500	600	700	800	900
$\alpha$	$\beta$	$\gamma$	$\delta$	$\epsilon$	$F$	$\zeta$		
1000	2000	3000	4000	5000	6000	7000		
				$\eta$				
				8000	9000			

FIG. 3  
GREEK NUMERICAL SYSTEM

were often indicated by placing a bar to the left or, in modern Gk type, by  $\alpha, \beta, \gamma, \delta, \epsilon, F$ , etc. This Gk numerical system is shown in Fig. 3. The myriads (= 10,000's) were represented by  $M$  or  $\bar{M}$  (10,000),  $\bar{B}$  (20,000),  $\bar{\Gamma}$  (30,000), and so on, or by a special symbol ( $\odot$ ) superscribed on units.

The Greeks had also the numerical system known as Herodianic (so named after the grammarian Herodianus, late 2nd cent. AD, who fully described it) or Attic (it is the only system found on ancient Attic inscriptions) or acrophonic (the initial of the name of the number being used as its symbol), while simple vertical strokes were used for the numbers 1 to 4. Thus  $\Gamma$  (an old form for  $\Pi$ , initial of  $\Pi\epsilon\Nu\epsilon$ , *pente*), 5;  $\Delta$  ( $\Delta\epsilon\kappa\alpha$ , *déka*), 10;  $\text{H}$  ( $\text{H}\epsilon\text{K}\alpha\text{T}\omega\text{n}$ , *hekátōn*), 100;  $\text{X}$  ( $\text{X}\iota\lambda\iota\omega$ , *khlíōt*), 1000;  $\text{M}$  ( $\text{M}\upsilon\pi\tau\iota\omega$ , *mýrtōi*), 10,000. These N. were frequently combined in ligatures. Tens of thousands were sometimes indicated by dots. Special symbols were sometimes used for fractions, sometimes an accent or a line above the numeral indicated the fraction; as, for instance;  $\nu$  or  $\nu' = \frac{1}{2}$ ,  $\gamma' = \frac{1}{3}$ ,  $\nu\gamma' = \frac{1}{4}$ , or  $\frac{2}{3}$ ,  $\nu\gamma' = \frac{1}{4}$ ,  $\delta' = \frac{1}{5}$ .

*The Etrusco-Roman Numerals.* The origin of the Etruscan and Roman N. is still obscure (apart from the N. 1 to 4, which were represented by one to four vertical strokes (I, II, III, IIII)). Etruscan had special symbols for 5, 10, 50, 100, and 500. According to some scholars (e.g.

Mattheus Hostus, 16th cent., and De Feis, 19th cent.), they were based on number 5; thus  $\Lambda$  for 5 would be the inverted form of V, which was derived from the open hand, the fingers with the exception of the thumb being held together; X for 10 would be a double V; 50 would be the 5 with a vertical stroke, and doubled would represent 100; and a horizontal stroke on the base of 50, 500 (see Fig. 4). According to another theory these symbols were based on the decimal system, X for 10 being derived from two oblique lines crossed, 100 being the same symbol with the addition of a vertical line, and 5 and 50 being the same symbols halved (Fig. 4). Concerning the origin of the

10,000,  $((I)) = 100,000$ . The last symbol, repeated 23 times (= 2,300,000), appears on the *columna rostrata* inscription, commemorating the Roman victory off Mylae (Milazzo) in the First Punic war (260 BC). In some inscriptions we also find IXI (or IXI) for ten hundred thousand and IMI for thousand hundred thousand. The forms CID (= 1000) and ID (= 500) appear as late as the 16th cent. The subtractive principle (IV instead of IIII, for 4; IX instead of VIIII, for 9;

$$\oplus, \otimes, \ominus, \odot = C, C = 100$$

I	II	III	IIII	$\Lambda$	X	$\Lambda$	$\times$	$\Delta$
1	2	3	4	5	10	50	100	500

FIG. 4

ETRUSCAN NUMERALS

Rom. symbols C (100), M (1000), L (50), and D (500), the most probable theory is that they derive from the Gk letters *thêta*, *phi*, and *khi*, which the Romans did not use as letters but retained as numbers. As to the use of *thêta* for 100 we have also early forms (see Fig. 5a), and we may assume that written rapidly with a stylus or a reed pen the circular symbol was left incomplete, and under the influence of the initial of C(ENTUM) (100) it became C. *Phi* (Fig. 5b) became the symbol for 1000 and under influence of M(ILLE) (1000) became M. An early form of the Gk letter *khi* (Fig. 5c) became L for 50. D is generally thought to be merely half of the letter *phi*; it was occasionally written CI (see Fig. 5b) and appears very commonly as ID. The Etruscans and the Romans also employed other numerical symbols, but the aforementioned were the most commonly used. The vitality of the Rom. N. is astonishing; they were used throughout the Middle Ages, holding their own against the Indo-Arabic N., even being preferred for the calculation of money accounts, and, of course, they are still in use at the present day, though apparently confined to such purposes as the numbering of chapters in a book, and the chaptering of private statutes to differentiate them from public acts.

The present system of Rom. N., in which, for example, 1958 is written MCMLVIII, is a relatively recent development. In classical and early medieval times there was no unified method, especially in the case of large N. For 1000 there were various symbols:  $\phi$ ,  $\bar{X}$ ,  $\alpha$ , or (I) or  $\bar{I}$  (see also above, concerning the origin of M = 1000); multiple thousands could be indicated either by a bar over a number, such as  $\bar{I} = 1000$ ;  $\bar{X} = 10,000$ ;  $\bar{C} = 100,000$  (unless the bar was employed to distinguish the numeral from a noun), or by a semicircle:  $(\phi) = 10,000$ ,  $((\phi)) = 100,000$ , or else (I) = 1000, ((I)) =

$$\oplus, \text{CID}, \text{h}, \text{M} (\text{ch}, \infty, \text{h}, \sim) \\ = M = 1000$$

$$\downarrow, \downarrow, \perp, L = 50$$

ORIGIN OF THE HIGHER ROMAN NUMERALS

a, 100 from the Greek *thêta*; b, 1000 from the Greek *phi*; c, 50 from an early form of the Greek *khi*.

XC instead of LXXXX, for 90; and XCIX instead of LXXXXVIII, for 99) was rather rare even in medieval times; indeed, we generally find CCCC for 400, IIII for 4, etc. But already in the late 16th cent. (ed. of Capella. Leyden, 1599) we find CID. ID. IC (= 1000. 500. 99) for 1599. It is worth while mentioning that in France down to the 18th cent. we find Rom. numerals used in combination with the vigesimal system (see above):  $iiij^{xx} (= 4 \times 20 = \text{quatre-vingts} = 80)$ .

*The 'Arabic' Numerals.* The expression 'Arabic N.' used for our common system of numerical notation is a misnomer. Moreover the origin of this system is not quite certain. It is, however, generally believed that our common numerical symbols originated in India, that they were carried to Bagdad in the 8th cent. AD, and thence found their way to Europe, where they were known, in Spain and in Italy, at least in the 10th cent. The Arabs themselves attributed the origin of the 'Arabic' N. to the Hindu and called them *hindasi*. The great Arabian mathematician ('Abû 'Abdallâh Mohammed ibn Mûsa) al-Huwârîzmi, of the 7th to 8th cent., wrote a treatise on the *hisâb hindî*, 'the Hindu calculation.' Carra de Vaux (*Scientia*, 1917, p. 273), however, suggested that the Arabic word *hind*,

or rather *hnd*, does not mean 'Hindu,' but is of Persian origin (*end*), meaning 'arithmetic measure, geometry'; that the 'Arabic' N. did not originate in India from alphabetic letters (as it is generally believed), but were conventional symbols invented in neo-Platonic schools, and were used in Persian pre-Islamic schools, whence they passed to Bagdad, on one hand, and on the other hand to India. But Carra de Vaux is practically alone in holding this view. On the other hand, it must be pointed out that our 'Arabic' N. were not used by the Arabs, who evidently derived their forms from some other source, and in course of time further modified them in some respect (see Fig. 6). At any rate, these N. are found in Spain as early as the 10th cent.; they were called *hurūf al-ʿubūr*, 'the dust N.,' probably because they were written on the dust *abacus* (see below) instead of being represented by counters. The first European scholar who is definitely known to have employed the new N. is Gerbert, who in 999 became Pope Sylvester II. He went to Spain in 967. The oldest definitely dated European MS. that contains these N. was written in Spain in 976 (see Fig. 6, line 3). The later changes in the forms of N. which took place in Italy may be seen in the same fig. (line 20).

A little consideration will convince one that, however obvious it may be to suggest arbitrary signs for the N. from 1 to 9, the relative positions of such signs according to a decimal indicate a maturity of thought in calculation that no merely arbitrary system can explain. It will be seen that what to moderns may seem arbitrary is in reality a slow development, starting from a simple if cumbersome principle, and worked out by a gradual and highly ingenious eclecticism. Lastly, researches by various scholars show that the Hindu system, all-important from the fact that after being improved by Arabian, Italian, and other savants it formed the basis of the system now in vogue throughout Europe, though admittedly obscure in origin, is not only clearly of high antiquity, but reveals on inquiry a foundation of still older systems. These began the only obvious mode of constructing symbols of number, viz. by repetitions of a single unit, and developed gradually by the use of zero, and a true denomination for each cipher, determinable on a decimal system. The great problem in these various ancient systems was to keep numbers of different denominations separate; it did not occur all at once even to the subtle orientals to represent units, tens, hundreds, etc., by position, for the use of a sign for zero comes late in the developed Indo-Arabic notation. The independent employment of a zero symbol by the pre-Columbian Mayas (see above) has no influence on the development of our common notation.

The old method of keeping digits distinct was by means of the *abacus*, or reckoning-board, consisting of balls strung on wires or rods set in a rectangular frame. The abacus was used both by the Greeks and the Romans, and is still

1		٢	٣	٤	٥	٦	٧	٨	
2	١	٢	٣	٤	٥	٦	٧	٨	٩
3	١	٢	٣	٤	٥	٦	٧	٨	٩
4	١	٢	٣	٤	٥	٦	٧	٨	٩
5	١	٢	٣	٤	٥	٦	٧	٨	٩
6	١	٢	٣	٤	٥	٦	٧	٨	٩
7	١	٢	٣	٤	٥	٦	٧	٨	٩
8	١	٢	٣	٤	٥	٦	٧	٨	٩
9	١	٢	٣	٤	٥	٦	٧	٨	٩
10	١	٢	٣	٤	٥	٦	٧	٨	٩
11	١	٢	٣	٤	٥	٦	٧	٨	٩
12	١	٢	٣	٤	٥	٦	٧	٨	٩
13	١	٢	٣	٤	٥	٦	٧	٨	٩
14	١	٢	٣	٤	٥	٦	٧	٨	٩
15	١	٢	٣	٤	٥	٦	٧	٨	٩
16	١	٢	٣	٤	٥	٦	٧	٨	٩
17	١	٢	٣	٤	٥	٦	٧	٨	٩
18	١	٢	٣	٤	٥	٦	٧	٨	٩
19	١	٢	٣	٤	٥	٦	٧	٨	٩
20	١	٢	٣	٤	٥	٦	٧	٨	٩

D. Düringer

FIG. 6  
DEVELOPMENT OF THE ARABIC  
NUMERALS

1, Deva-nagari letters of the 2nd cent. AD; 2, Arabic numerals of the 10th cent. AD; 3, the earliest examples of Arabic numerals in Latin MSS. Escorial Library, Spain: MS. of AD 976; 4, other forms of the Arabic numerals, W. type; 5-8, Arabic numerals, E. type (8, modern Arabic numerals, as employed in Arabic script); 9-13, the so-called apices of Boëthius of the 11th and 12th cents. AD; 14, the numerals of John Basingestockes (d. 1252); 15-17, Arabic-Byzantine numerals of the 12th to the 15th cents.; 18, numerals in a MS. from France (now in Berlin), of the second half of the 12th cent. AD; 19, numerals in an Italian MS. from Florence of the first half of the 14th cent. AD; 20, numerals in an Italian MS. of the 15th cent.

used in many oriental countries, especially China, for complex calculations. The movable balls are used as counters to record the steps in an arithmetical operation, and each column or compartment represents a particular value to be

assigned to a counter or ball placed or moved on to it. As soon as distinctive symbols or ciphers are used instead of counters to represent the numbers from 1 to 9, and a sign for zero used, the abacus or any other similar mechanical contrivance becomes superfluous, and the problem of calculation by reference to position is solved. Apparently Europe owes the whole of its modern arithmetic to the Indians and Arabs, for the decimal system, or mode of reckoning by tens through the instrumentality of the zero, seems to come from India through the Arabs. Whether the Greeks arrived at the decimal system, and the use of position and the zero as the most convenient mode of reckoning, independently of the oriental nations is apparently unknown. Certainly it seems that the value of position might soon have been suggested to them by the dash which, as shown above, was written on the left of a sign for thousands; at all events it is possible that from this use of the dash or stroke the Greeks began to associate high numbers with position to the left. If then, for example,  $7000 + 800 + 40 + 2$  were represented by  $\zeta, \omega, \mu,$  and  $\beta$  respectively, it would be a natural step to eliminate the dash and run the 4 symbols together thus,  $\zeta\omega\mu\beta$ , with a line or vinculum over the top to differentiate from a mere word. However, our common numerical system, generally known as the 'Arabic N.' is the most simple and the most developed of all the numerical systems, ancient or modern.

See F. Wopcke, 'Mémoire sur la propagation des chiffres indiens,' *Journal Asiatique*, 1, 1863; D. Friedlein, *Die Zahlzeichen und das elementare Rechnen der Griechen und Römer*, 1869; I. Taylor, *The Alphabet*, 1883; C. Zangemeister, 'Entstehung der römischen Zahlzeichen,' in *Sitz.-Ber. der Königl. Preussischen Akademie*, 1887; D. E. Smith and L. C. Karpinski, *The Hindu-Arabic Numerals* (with bibliography), 1911; G. F. Hill, *Development of Arabic Numerals in Europe*, 1915; L. C. Karpinski, *The History of Arithmetic*, 1925; D. E. Smith, *History of Mathematics* (vol. II, with bibliography), 1925; D. Diringer, *L'alphabet nella storia della civiltà*, 1937, and *The Alphabet* (4th impression), 1953; C. I. Griffith, *The Story of Letters and Numbers*, 1939; L. Hogben, *From Cave Painting to Comic Strips*, 1949.

**Numerianus**, Marcus Aurelius, Rom. emperor, younger son of the Emperor Carus, whom he accompanied on his expedition against the Persians. Carus was assassinated in AD 283, and N. was elected emperor by the soldiers, but was himself assassinated 8 months later, whilst on his way back to Rome.

**Numerical Aperture**, see MICROSCOPE AND MICROSCOPY, Components.

**Numidia** (from Gk *nomides*, nomads, the land of Nomads), name given by the Romans to a part of the northern coast of Africa, corresponding to some extent with the modern Algiers. It was bounded on the W. by the R. Mulucha (now Moluya),

which separated it from Mauretania; on the E. by the R. Tusca (now Wadi-el-Berger), which separated it from the ter. of Carthage; on the S. it reached to the chains of Mt Atlas. The inhab. of N., as of Mauretania, belonged to the race from which the modern Berbers are descended.

**Numismatic Society, Royal**, see ROYAL NUMISMATIC SOCIETY.

**Numismatics** (from Gk *nomisma*, a coin with customary value, currency), study of coins and currency, has engaged attention since the It. Renaissance, when their historical and artistic value was first appreciated. The stimulus then given to coin collecting resulted in the formation of notable cabinets by many scholars and gentlemen: such national collections as those of France, Austria, and Sweden began as royal cabinets. To-day the study is widespread, both among private collectors and also in public institutions, which emphasise the value of N. in furnishing historical, economic, and artistic evidence. Numismatic societies and journals exist all over the world.

Early coinage sprang from the desire for a more generally acceptable exchange medium than cattle or axes or spits (characteristic of biblical, Homeric, and W. European economies), or knives or cloth (used in early Chinese times), when it was seen that metal (normally copper or silver or gold), exchanged by weight, combined reasonable universality with utility, durability, and beauty. The copper talent (the limit of human burden) quickly emerged as the Gk unit of weight. But fluctuating metal values, and the cumbrousness of weighing out metal in bars or broken fractions, still hampered exchange until (as evidenced by Pollux quoting Xenophanes of Colophon) Lydian kings, c. 650 BC, revolutionised currency by expressing copper values in small pieces of a more precious metal (electrum), by ensuring centralised control of weight and purity, and by stamping these pieces with a standard design. Ability to dictate the exchange value of distinctively marked metal within a given area is the origin of true coinage.

Peninsular Greece followed suit with silver, its characteristic metal: Pheidon of Argos (c. 620 BC) was credited with the revaluation of the old iron spits of the Peloponnese in terms of silver coins struck with the 'turtle' design at Aegina, a 'handful' of 6 spits being worth a new silver drachma. The age of colonisation had intensified Gk trade, which thus increased the need for coinage, and by c. 600 both Corinth and Athens were in a position to strike their own coins. They too adopted the drachma unit, related to the universal talent by the intermediate mina weight (= 60 talent) borrowed from the E.; but the price of silver varied owing to differing availability and transport costs, and this caused variety in the weight of the drachma, heaviest at Aegina, lightest at Corinth, and tended to divide the world into rival groups. Most Gk weight standards were offshoots, in one sense or another, of these original systems,



1, Corinth, silver stater, 4th cent. B.C.; 2, Elis, silver stater, 5th cent. B.C.; 3, Rome, silver denarius, 2nd cent. B.C.; 4, Rome (Caracalla), silver antoninianus, A.D. 215; 5, Louis le Débonnaire of Germany, silver denier, 814-40; 6, Ethelred II of England, silver penny, 979-1016; 7, St Louis of France, silver gros tournois, 1226-70; 8, Florence, gold florino from 1251; 9, Henry VIII of England, gold angel, 1509-26; 10, Arabic silver dirhem, A.D. 768; 11, Jehangir Khan of India, silver half-rupee, 1619.

Asiatic, Aeginetan, and Attic-Corinthian Euboic.

By 500 BC many Gk city states had their own mints, and by 350 BC Gk coinage was universally regarded as an important sign of political autonomy. The distribution of the various coinages, in hoards and site finds, accurately mirrors the main streams of Gk commerce. Each state adopted a distinctive coin device (an owl at Athens, a pegasus at Corinth (*see* *illus.*, 1), a barley-ear at Metapontum, etc.), with or without an inscription giving the city's name, as a guarantee of weight and purity. The coins were circular in shape, and bore 'types' on both sides, and, though often struck very carelessly, came to display a wonderful degree of skill and beauty, as at Elis (*see* *illus.*, 2), Amphipolis, and many Sicilian cities. By c. 400 BC, master engravers were signing their dies.

Soon after 450 BC imperialist Athens had tried, with some success, to subject a wide variety of independent mints and standards to her own economic control. A more important attempt was made, at the end of the 4th cent. BC, by the Macedonian Empire, which coined great quantities of gold and silver with standard types from mints in Greece, Asia, and the Levant: these bore a royal portrait (e.g. of Alexander the Great) in place of the old city badge. In areas not subject to Macedon the former idiom continued, the Rhodian and S. It. coinages gaining special importance.

By 300 BC a purely Lat. coinage was increasing in central Italy, including Rome, in the form of asses, i.e. cast bars or disks of bronze, originally about 1 lb. in weight, with their fractions. Contact with Gk colonies of S. Italy resulted at Rome in experimental silver coins being struck on a Gk standard; and growing use of silver led to a new silver-bronze ratio expressed, c. 190-180, in the denarius, worth 10 (and later 16) asses of steadily shrinking weight and size. This coin, which was destined to dominate the coinage of the Rom. Rep. and early empire and to father the medieval denier and penny, was soon produced in great volume, at first from the central mint of Rome, later from subsidiary it. mints as well, and finally also from 'travelling' military mints, reflecting the deep economic repercussions of Rome's wars of conquest. In contrast to the multiple coinages of Gk city states, the Rom. Rep. struck a virtually uniform and severely centralised coinage for the Mediterranean area as a whole. Technical control was vested in an ann. board of 3 moneyers, who at first rigidly respected the original 'types,' head of Roma-Bellona, and the Dioscuri (*see* *illus.*, 3). But by 100 BC moneyers were developing designs which reflected the majesty of Rome by reference to the achievements of its noble families, and from this it was a short step to the personally controlled issues (including gold) of the great war-lords, Sulla, Pompey, and Julius Caesar, the last of whom received the right of portraiture on his coins. Rom. coinage was by now imperial in all but name, and, save for base-metal issues

still permitted to local communities, supplied vast dominions with centrally controlled money.

It became openly imperial with Augustus's foundation of the principate (27 BC), which involved fundamental reform based on gold aureus, silver denarius, brass sestertius and dupondius, and copper as struck at various mints, with Lyons and Rome at first dominant. Henceforth it acquired new importance as a flexible imperial gazette, emphasising the virtues of imperial rule by means of rapidly changing 'types' which almost always included the emperor's portrait and titles with some allusion to his policy or achievement (*see* *illus.*, 4, Caracalla). Inflation, beginning with Nero, and debasement, increasing after AD 200, led to economic collapse c. AD 258; but Diocletian's economic and monetary reforms (AD 296) paved the way to a coinage temporarily stabilised on gold solidus, silver siliqua, and sundry copper denominations: solidus and siliqua survived the economic chaos of the 5th cent., and became the basis of early medieval currency. Late imperial coinage was struck at a large number of co-ordinated mints, and supplied an area extending from Spain to Asia Minor and from Britain to Egypt; and, though unofficial issues sometimes reflected local shortage or political disturbance, these were not frequent.

The collapse of the W. Empire in AD 476 left to the invading Franks, Goths, Burgundians, etc., the massive tradition of imperial coinage, which they preserved and adapted. Until c. AD 700 the use of gold in W. Europe continued; later gold was mainly replaced by silver, as in the Rhineland, Gaul, and Britain, though it was retained at Byzantium, the cap. of the still flourishing E. Empire and the source of a coinage which, remarkable for its Greco-Rom. idiom and for the beauty of its religious types, continued until it was overwhelmed by Turkish power in the 15th cent., though not before it had decisively affected the medieval coinage of Russia.

In central and W. Europe the virtual disappearance of gold coinage resulted in the medieval system built on the silver denier (*see* *illus.*, 5, Louis le Débonnaire, emperor of Germany, AD 814-40), normal in England in the form of the penny. Early medieval coins in most countries were struck by a wide variety of mints. Their religious idiom was strong (*see* *illus.*, 6, Ethelred II of England), though their style was often rough: the inscriptions usually indicated the minting authority, the mint, and not infrequently the moneyer. The Holy Rom. Empire gave universality to the system, which, even when imperial control weakened and the rights of coinage passed to independent authorities (princely, eccles., and civil), remained in general use.

The crusades revived W. knowledge of the Levant and led to a resumption of gold coinage in Europe: to the earlier gold 'bezants' of Byzantium were added the fiorino of Florence (*see* *illus.*, 8) and the

sequins of Venice, Italy taking a large part in E. contacts. France, Spain, and England (the last with her nobles, ryals, and (see illus., 9) angels) followed suit with gold coinages in the 13th and 14th cents.: this multiplication of values encouraged the introduction of the Fr. gros tournois (see illus., 7, St Louis, 1226-70), a silver coin much larger than the denier and imitated in England as the groat, worth 4 pennies. The development of central European silver-mines, and the discovery of the rich deposits of the new world, were soon reflected in the profuse issue of the large silver thaler and its derivative family of which the increased size allowed die-engravers scope for the splendid designs of the Renaissance to replace the austere Gothic idiom. The monarch's portrait became in general a standard requirement on the obverses: the reverses were usually given up to increasingly elaborate heraldic or naturalistic designs, often accompanied by religious inscriptions. Technical difficulties in striking such large coins were overcome by the introduction of machinery from 1560 onwards, adopted in England in 1662, after which time a grained ('milled') or raised edge protected coins against the evil of clipping.

Emphasis on gold and silver was modified from the 17th cent. onwards by the general development of low-value copper coins for everyday use, especially in France, Germany, and the Netherlands, an example soon followed in England, at first in the form of municipal or private trade tokens. The pattern of European coinage continued without major change in the 18th and 19th cents., though momentarily interrupted by the Fr. Revolution and by Napoleon's conquests. After 1814 it was radically altered. The rising price of gold made it unsuitable for further use as a coinage metal, and its place was largely taken by bank-notes (q.v.), which had already enjoyed a long hist.; and with the crumbling of monarchies and the rise of dictatorships republican or nationalist types displaced the traditional designs. The Second World War did for silver what the first did for gold, and nickel alloys are now in general use to take its place.

The expansion of the Brit. Empire from the 17th to the 19th cent. saw European coinage grafted on to many overseas possessions. The E. India Co.'s coinage, begun in the 17th cent., was transformed after 1857 into the imperial coinage of India. Amer. issues, first produced for the New England colonists, lapsed after 1773, to be replaced by the earlier U.S. issues from which, in association with the coinage of Canada (from 1820), the great N. Amer. dollar coinage has developed: the S. Amer. coinages derive more directly from the currency traditions of the invading Spaniards. The 19th cent. saw coinage extended to the W. and E. Indies, Africa, Australia, and New Zealand, and to many colonies, such as Hong Kong: even now many of such issues are produced by the Royal Mint (q.v.) in London, which, besides contracting to coin for other govts., has also struck its share of the Maria

Theresa dollars that for 150 years have been a traditional currency in N. Africa and the Middle E.

In contrast to the European coinage family, based on the idiom of state sovereignty displayed with the utmost variety of pictorial type and inscription, the immense Muslim group, extending in its time from Spain to Turkestan, is externally one of the most homogeneous in the world. It began in the 7th cent. AD, as a religious coinage from which representation of the human figure was excluded: its types consisted only of Arabic inscriptions defining ruler, mint, and date and including certain religious formulae. The spread of the Muslim faith introduced minor variations as Arabic coinages absorbed, or were merged in, other systems, sometimes becoming bilingual (as in the Sassanian series), and sometimes even admitting a pictorial type, as in the Zodiaca series of Jahangir (or Jehangir) Khan in India (see illus., 11). But in general the original form has been strictly preserved. The gold dinar and the silver dirhem (see illus., 10), widespread in the Middle E. and characteristic of early N. European trade routes, developed a tradition of calligraphic beauty alive in Muslim coins to-day. The coinage of India has been in part Muslim and in part Hindu with Sanskrit inscriptions and pictorial designs.

Of the Far E. family Chinese coinage began in remote antiquity. The first round coins, which give a glimpse of an earlier stage of tool- and cloth-money, were made, by casting (regularly preferred in China to striking), appreciably before the first Lydian or Gk coins; and the Christian era saw a long-estab. series of pierced circular coins of bronze, the standard Chinese coinage metal. For some 19 cents. this continued with little change. The coins bore no pictorial representation of the emperors: their ideographs mentioned only mint and denomination. In the 20th cent. the series has been Europeanised, being based on a struck silver pictorial dollar of 100 cents. The origin of Jap. coinage was later by sev. cents., owing to isolation and a simple agric. economy: even after the first copper was produced in the 7th cent. AD, the majority of coinage from the 9th to the 15th cent. was imported from China. Afterwards a true Jap. series was developed based on the gold oban and koban, and from the late 19th cent. has followed the decimal system, in gold, silver, and copper, with traditional pictorial types but no imperial portraiture.

Notice must be taken, finally, of certain quasi-monetary issues, in addition to tokens and jetons (q.v.), which fall outside the class of true coinage. These are mostly pieces of necessity, such as siege-pieces (e.g. struck by Charles I in England) or camp-money (as produced in the Boer War) or purely temporary money (in the form of leather or porcelain or even of postage stamps) to tide over a period of crisis. In addition many examples survive, side by side



with true coinage, of primitive 'commodity currencies' such as sugar, tobacco, tea, or salt. Medals (q.v.) have never enjoyed the status of pieces of currency.

The chief public coin collections are as follows: in Great Britain, at the Brit. Museum and the univs. of Oxford, Cambridge, and Glasgow; on the continent of Europe, at Paris, Brussels, The Hague, Copenhagen, Stockholm, Oslo, Munich, Vienna, Rome, Milan, etc., and Budapest (the disposition of the great Berlin collection, which is now in Russian hands, is uncertain); and in New York. They are fed, partially, by recurrent finds of coins formerly hoarded for safety. The law of treasure trove varies from country to country: in the U.K. the Crown claims associated objects of gold and silver for their archaeological or historical value, allocating to the Brit. Museum what is there required and paying to the finder the full antiquarian value of any object thus retained. See also MEDALS and TRADESMEN'S TOKENS.

For the earliest coinages see W. Ridgeway, *The Origin of Metallic Currency*, 1892; G. Macdonald, *The Evolution of Coinage*, 1916; A. H. Quiggin, *A Survey of Primitive Money*, 1949; for Gk coins, B. V. Head, *Historia numorum*, 1911, and (ed. G. F. Hill) *The Principal Coins of the Greeks*, 1932; C. T. Sellman, *Greek Coins*, 1933, and *Masterpieces of Greek Coinage*, 1949; for Rom. coins, H. Mattingly, *Roman Coins*, 1929, and (with E. A. Sydenham and C. H. V. Sutherland) *The Roman Imperial Coinage*, 1923-; for medieval and modern coins, A. Engel and R. Serrure, *Traité de numismatique du moyen âge*, 1891, and *Traité de numismatique moderne et contemporaine*, 1897; M. Comencini, *Coins of the Modern World*, 1937; Warty Raymond, *Coins of the World* (20th cent.), 1945; for Eng. coins, G. C. Brooke, *English Coins* (reprinted, with supplement), 1949. See also L. A. Mayer, *Bibliography of Moslem Numismatics (India excepted)*, 2nd revised ed., 1954; and for the law on treasure trove see G. F. Hill, *Treasure Trove in Law and Practice*, 1936.

**Nummulites**, large coin-shaped fossil foraminifera, composed of numerous whorls coiled in a plane spiral, the whorls being divided into chambers by septa. They are common in Tertiary rocks, particularly Eocene limestones in Egypt and elsewhere, and are valuable as index fossils.

**Nummulitic Limestone**, limestone composed of the large foraminifera known as Nummulites which flourished in early Tertiary times, especially characteristic of the Eocene. The pyramids of Egypt are made of N. L.

**Nun** (Lat. *nonna*), woman who has consecrated herself to God by vow and who has also bound herself to live in a convent under a certain rule. From the beginning of the Christian Church the existence of women devoted to virginity and religious offices may be recognised, and it is probable that they early joined together in communities. The commonest formula for vows is that binding them

to voluntary poverty, chastity, and obedience, to which is sometimes added a fourth concerning the particular task, e.g. education, to which they dedicate themselves. Convents are either under the authority of the bishop of the diocese in which they are situated, or (in the Rom. Church) are attached for purposes of supervision to the corresponding male branch of the order, and in this case they are termed 'exempt,' i.e. from episcopal control, the ultimate authority for them being the Holy See. N.s. are either enclosed, which means that they never leave their cloister, or unenclosed, in which case they go out to perform works of charity in schools, hospitals, etc.; nearly all modern orders are of this latter type. All N.s. bound by 'solemn' vows are under the obligation of reciting the divine office in choir; but practically all modern orders have 'simple' vows which do not carry this obligation, largely on account of the calls of the work in which they are engaged. See also CONVENT.

**Nun**, in Egyptian religion, the primeval watery chaos, on which the world floats as a disk. According to the Heliopolitan theory of creation, the oldest of 8 primordial deities. In the Heliopolitan theology Atum, a form of the sun god Ra, emerged from N., being reborn every morning. In the Memphite theology N. was one of 8 gods of creation contained in Ptah (q.v.).

**Nun Moth** (*Liparis monacha*), black and white moth known as Black Arches in Britain. It is a great pest in Europe, since its caterpillars destroy tree leaves. Poison dust-spraying from the air has been successfully used.

**Nunatak**, a mt. peak which projects through the surface of an ice sheet.

**Nunc Dimittis**, or **The Song of Simeon** (Luke i. 29 ff.), canticle which forms part of the Catholic office of compline. It also appears in the Anglican office of Evening Prayer, after the second lesson.

**Nuncio**, see LEGATE.

**Nuncomar**, see HASTINGS, WARREN.

**Nuncupative Will**, verbal will or oral declaration of one's testamentary intentions before witnesses. In general a will, both in Eng. and Scots law, is totally void unless made in writing. Soldiers or sailors over 14 years of age can dispose of their goods and chattels by a N. W., but since the Navy and Marine (Wills) Act, 1865, a N. W. made by a man in his majesty's naval or marine forces will not be effectual so as to dispose of his wage or other money due to him by the Admiralty, though apparently the Admiralty have a discretion to pay the wages to the claimant under an oral will. It is to be noted that the term N. W. is often applied to an informal written will made by a soldier on active service, such wills generally being valid if sufficiently proved. It is doubtful how far the N. W. of a civilian is valid, but in all cases where effect has been given to such a will, it was satisfactorily proved that the testator at the time of making it was in *extremis*. See also DONATIO MORTIS CAUSA. See Jarman, *On Wills*.

**Nuneaton**, municipal bor. and mkt. tn of Warwickshire, England, on the Anker,

8½ m. NE. of Coventry and 97 m. from London. Its chief buildings are the churches of St Nicholas and St Mary the Virgin, the former a handsome church in various styles of architecture and with a square embattled tower and pinnacles. There is a 16th-cent. grammar school; also Arbury Hall, one of the finest examples of Gothic architecture in the co. N. has coal-mines, iron works, and manufs. of woven worsted articles, elastic, ribbon, etc., and of tiles, sanitary pipes, and glazed bricks. Here was *b.* the novelist George Eliot (Marian Evans). A nunnery, founded in 1150, gave the tn its name, and on its ruins was built the church of St Mary's (1877). Pop. 55,000.

**Nuñez, or Nonius, Fernan** (c. 1470-1553), Sp. writer and teacher, *b.* Valladolid. He was a prof. of Gk at Alcalá and Salamanca Univs. He pub. various eds. of the classics and helped to compile the Lat. version of the Septuagint.

**Nuñez Cabeza de Vaca, Alvar, see VACA.**

**Nunn, Sir Percy** (1870-1944), Eng. educationist. Educ. at Bristol Univ., he taught in secondary schools from 1891 to 1905. In 1905 he was made vice-president of the London Day Training College, and in 1913 prof. of education in the univ. of London (prof. emeritus, 1937). He succeeded Sir John Adams as principal of the college (1922). In 1932 the college was transferred to the control of London Univ. and became the Institute of Education, N. continuing in office as director until 1936. He was president of the Training College Association in 1915; chairman of the education section of the Brit. Psychological Society, 1919; president of the Mathematical Association, 1923; and visiting prof., Columbia Univ., 1925. He also served as a member of the advisory committee of the Colonial Office on education and as a senator of London Univ. From 1923 to 1924 he was president of the Aristotelian Society, and in 1927 he delivered the ann. philosophical lecture to the Brit. Academy on 'Anthropomorphism and Physics'. His publs. include a report for the Board of Education on *The Training of Teachers in Mathematics*, 1912, *Teaching of Algebra*, 1914, *Education Reform*, 1917, *Education: its Data and First Principles*, 1920, and *Relativity and Gravitation*, 1923, generally regarded as his best work. The central thesis of his work on the data and first principles of education maintains that the primary aim of all educational effort should be to help boys and girls to achieve the highest degree of individual development of which they are capable, while not undervaluing the just claims of public duty and social service. N. gives much attention to the significance and the value of intelligence tests, and explains the ideas underlying the theory of the tests from the psychological standpoint in an analysis of the concepts of *hormé* and *mnemé* (the use of the term *hormé* embracing the concepts of purposive energy as manifested both in conscious and unconscious behaviour; and that of *mnemé* all the varied phenomena referred to by Samuel Butler to memory

conscious or unconscious). On vocational education N. concludes that, if conducted in a liberal spirit, it is permissible but cannot be made universal. On the other hand, 'in its concentration of interest on matters whose social value is evident, in its strong appeal to the practical activities, it contains elements which should, in some form, have a large place in every educational scheme.'

**Nuoro:** 1. Prov. of Italy, in central Sardinia (q.v.). It has a long coastline on the E., a short coastline on the W., and is generally mountainous, with numerous riv. valleys. Area 2805 sq. m.; pop. 269,000.

2. Tn in Sardinia, cap. of the prov. of N., 78 m. north by E. of Cagliari. It is a modern tn, and a popular holiday resort. Pop. 17,600.

**Nupé**, dist. of northern Nigeria, W. Africa; area 6400 sq. m., formerly part of the Fulani empire. The inhab. are predominantly Muslim. The emir installed by Brig. Gen. Lugard (afterwards Lord Lugard) in 1901 agreed to recognise Great Britain as protecting power and to put an end to slave raids. The products of N. include cattle, rice, guinea-corn, and shea-butter. See A. Burns, *History of Nigeria*, 1929; S. F. Nadel, *A Black Byzantium. The Kingdom of Nupé in Nigeria*, 1942.

**Nuphar**, genus of aquatic plants (family Nymphaeaceae), of which 2 are Brit. *N. lutea*, the yellow water-lily or brandy-bottle, is common in lakes and rivs. It bears large, yellow, strongly scented globose flowers and both submerged and floating leaves. *N. pumila*, a much smaller plant, occurs in small lakes in Scotland. *N. advena* is a N. Amer. species for garden streams.

**Nuraghe, Nurraghi, Nurags**, are the round towers of Sardinia (q.v.), of which there are about 3000, and which are of very great antiquity. These towers, which resemble the brochs (q.v.) of Scotland and tal-yots of Minorca, are built of various stones, such as granite, basalt, and limestone, and consist of 2 or 3 storeys, reached by means of a spiral staircase. Their original purpose is not known, nor is there any existing information as to their builders. See J. Fergusson, *Rude Stone Monuments in all Countries: their Age and Uses*, 1872, and Sir R. Lambert Playfair, *Handbook to the Mediterranean* (3rd ed.), 1890.

**Nur ed-Din Mahmud, Malek-al-Ade** (1117-74) (surnamed 'El-Shahid' (the martyr) by Mohammedan historians), sultan of Syria, *b.* Damascus. He succeeded his father as Emir of Aleppo in 1145, and tried to expel the Christians from Palestine. The Christian defeat at Edessa led to the second crusade, but by 1151 many Christian strongholds in Palestine were in his hands. In 1169 he overran Egypt, and was created Sultan of Syria and Egypt by the Caliph of Bagdad. He prepared the way for the destruction of the kingdom of Jerusalem by Saladin.

**Nuremberg** (Ger. Nürnberg), Ger. city in the Land of Bavaria (q.v.) on the Pegnitz, 93 m. north by W. of Munich (q.v.).

The earliest settlement grew up about a royal fortress. It rose rapidly to importance owing to its position at a junction of 2 great trade routes. In 1219 it was declared an imperial city, and it became the finest city in Germany; the Golden Bull (q.v.) ordained that every Ger. emperor should convoke his first diet in N. By the end of the 14th cent. the pop. numbered over 20,000. It was the first of the imperial cities to embrace Protestantism (1525). After the Thirty Years War (q.v.) the prosperity of the city declined. In 1806 it was incorporated into the kingdom of Bavaria. During the Nazi regime (see NATIONAL SOCIALISM) the ann. party rallies took place in the Dutzendteich dist. to the SE. of the city; the stadium here holds 50,000 spectators. The city suffered severe damage from bombing attacks, 1941-5, and from air and land attack in April 1945 during the final battle for its possession. At the end of the war N. was selected as the site for the trial of the Ger. war leaders (see NUREMBERG TRIAL). The riv. divides the city into 2 main dists.: St Sebald, the oldest, on the north, and St Lorenz on the S. On a rock, 200 ft above the level of the riv., stand the rambling buildings of the old fortress (11th-16th cent.), and the massive city walls, with their gates and watchtowers, still exist. The city is famous for its anct. houses and for its wealth of Gothic churches and public buildings; in spite of war damage many of these remain: the 13th-cent. *Sebaldskirche* contains fine statuary and the famous bronze shrine of St Sebald, which is the work of Vischer (q.v.); the 14th-cent. *Marthakirche* was the meeting-place of the Meistersingers (q.v.), made famous by Hans Sachs (q.v.); the 14th-cent. *Frauenkirche* contains work by Adam Kraft, and has, over its W. door, a 16th-cent. clock with moving figures of the 7 Electors paying homage to Charles IV; and the *Lorenzkirche* (13th-15th cent.) has one of the finest rose-windows in Germany and a remarkable tabernacle of Adam Kraft. Few of Dürer's (q.v.) works are found in his native city, but a Dürer museum exists in a house which is a copy of the one in which the painter lived, 1509-28. In the Germanic National Museum there is a notable collection of Ger. art. The chief industries are the manuf. of machinery, electrical apparatus, motor vehicles, toys (ann. toy fair), paper, glassware, and celluloid. Pop. 411,200.

**Nuremberg Decrees**, name given to 2 decrees 'unanimously adopted' by the Ger. Reichstag at Nuremberg on 15 Sept. 1935, at the time of the Nazi party rally. Their effect was to exclude Jews from the privileges of citizenship. The *Law Respecting Reich Citizenship* declared (Para. 1, 1): 'One who belongs to the protective union of the German Reich and is therefore under particular obligation to it, is a national.' (Para. 2, 1): 'Only a national of German or kindred blood, who proves by his conduct that he is willing and likely to serve faithfully the German people and Reich, can be a citizen.' The *Law for the Protection of German Blood*

and *German Honour* declared (Para. 1, 1): 'Marriages between Jews and nationals of German or kindred blood are forbidden. Marriages concluded in defiance of this law are void. . . .'

**Nuremberg Trial**, international trial of major Ger. war criminals following the Second World War, which occupied 9 months between Nov. 1945 and Oct. 1946 and ended in the conviction and sentence of most of the surviving leaders of the Third Reich for their part in preparing and waging aggressive war and for crimes against humanity. Long before the war had ended the Allies gave consideration to the question of the treatment which should be meted out to Hitler and his leading criminal associates, and in the meantime the International War Crimes Commission was set up to examine material bearing upon individual war crimes. Some favoured the shooting of the Nazi leaders out of hand, but the alternative of a public trial before a bench of judges nominated by the chief allied govs. gradually prevailed, though it was only in the last year of the war that negotiations were begun and completed for a 4-power (America, Britain, Russia, and France) pact under which the Nuremberg court would be set up. Hence emerged the charter of the court, a document entirely without precedent, which authorised the tribunal, sitting as a court of criminal jurisdiction, for the trial of those brought before it for breaches of international law and cognate war crimes. The defect in the past in prohibitive provisions of international law had been that there was no court with power to try and to punish the transgressor. It was the creation of the court, not the enunciation of the law, that was the novelty; and few people felt their sense of justice outraged when, on Germany's collapse, the Allies decided to create such a court rather than allow those who were guilty of such outrages against humanity to violate the law with impunity.

The trial was actually opened on 20 Nov. 1945, under the presidency of Lord Justice Lawrence (later Lord Oaksey). The tribunal consisted of 4 members, each with an alternate to act in case of illness or the like, and each contracting country chose its own member and alternate. The accused were Marshal Goering (q.v.); Rudolf Hess (q.v.), the Fuehrer's one-time deputy; Joachim von Ribbentrop (q.v.), Reich foreign minister; Dr Robert Ley, leader of the Ger. labour front; Alfred Rosenberg, gauleiter of Poland; Dr Hans Frank, a former governor-general of Poland; Hans Kaltenbrunner, Heydrich's (q.v.) successor as chief of the Ger. security police; Julius Streicher (q.v.), governor of Franconia; Marshal Keitel, chief of staff and commander of the Wehrmacht; Dr Walter Funk, Reich minister of economics; Dr Hjalmar Schacht, Germany's leading economic and financial expert for many years; Gustav Krupp von Bohlen, head of the Krupp armament works; Adm. Raeder, naval commander-in-chief from 1935 to 1943; Adm. Doenitz (q.v.); Baldur von Schirach, founder of the

Hitler Youth; Fritz Sauckel, responsible for the Reich's total mobilisation and enslaving foreign workers in Ger. factories; Prof. Albert Speer, Reich minister of armaments and war production; Martin Bormann, chief of Hitler's chancellery, and deputy Fuehrer in place of Hess; Franz von Papen, Ger. diplomat; Gen. Alfred Jodl, Hitler's personal military adviser; Baron von Neurath, foreign minister before Ribbentrop became gauleiter of Czechoslovakia; Arthur von

women, and children, and in his final speech at Nuremberg Sir Hartley Shawcross, Brit. attorney-general, demanded the death penalty for all the prisoners, whom he said should be held responsible for the deaths of that number of victims. The tribunal was, further, asked by the prosecution to declare a number of named groups or organisations to be criminal within the charter, so that membership rendered the individual member liable to the death penalty. All the defendants



*New York Times Photos*

#### DEFENDANTS AT THE WAR CRIMES TRIAL AT NUREMBERG, 1946

*Left to right, front row:* Goering, Hess, Ribbentrop, Keitel, Rosenberg, Frank, Frick, Streicher, Funk, and Schacht.

*Left to right, back row:* Doenitz, Raeder, von Schirach, Sauckel, Jodl, von Papen, Seiss-Inquart, Speer, von Neurath, and Fritzsche.

Seyss-Inquart, minister of the interior and security in the Austrian Cabinet, and later Nazi commissioner for Holland; Wilhelm Frick; and Hans Fritzsche, deputy propaganda minister and a leading broadcaster, Robert Ley committed suicide in prison (25 Oct. 1945); Krupp von Bohlen's physical and mental condition precluded his trial; Bormann was tried in his absence under the provisions of the charter.

The indictment charged the defendants with crimes against peace by the planning, preparation, initiation, and waging wars of aggression, which were also wars in violation of international treaties and agreements, with war crimes, and with crimes against humanity (*see also* CRIMES, WAR). It charged them with responsibility for the death of 12,000,000 men,

were represented by counsel and also all counsel were chosen by themselves. The case against the defendants was opened (21 Nov.) by the chief Amer. prosecutor, Justice Robert Jackson, who said that the 'trial represented the practical effort of four of the most mighty nations, with the support of fourteen more, to utilise international law to meet the greatest menace of their times—aggressive war. These twenty-two broken men and others created in Germany under the *Fuehrerprinzip* a national socialist despotism equalled only by the dynasties of the ancient East. . . . They led their people on a mad gamble for domination, diverted energies and resources to the creation of what they thought to be an invincible war machine, and they overran their

neighbours, bringing in millions of human beings as slave labourers. At length bestiality and bad faith reached such excess that they aroused the sleeping forces of imperilled civilisation which by its united efforts had ground the German war machine to fragments.' The Brit. prosecutors included, besides the attorney-general, Sir David Maxwell Fyfe (later Lord Kilmuir). Gen. Rudenko was the chief prosecutor for Soviet Russia. Some 403 open sessions of the tribunal were held. Thirty-three witnesses gave evidence orally for the prosecution against the individual defendants, and 61 witnesses, in addition to 19 for the defendants, gave evidence for the defence. A further 143 witnesses gave evidence for the defence by means of written answers to interrogatories. The tribunal appointed commissioners to hear evidence relating to organisations and the tribunal itself heard 22 witnesses for the organisations. Much of the evidence presented to the tribunal on behalf of the prosecution was documentary evidence, captured by the allied armies in Ger. Army H.Q., gov. buildings, and elsewhere. The case, therefore, against the defendants rested in a large measure on documents of their own making, the authenticity of which was not even challenged except in one or two cases. Of the 22 prisoners present at the trial, only 3 were acquitted. These were Schacht, von Papen, and Fritzsche. The tribunal sentenced 12 of the accused to death, 3 to imprisonment for life, and 4 to lesser terms. The Soviet judge dissented from the acquittals. The Allied Control Council rejected all appeals for clemency by the prisoners and also rejected the plea by Goering, Jodl, and Keitel to be shot instead of hanged. Shortly before he was to have been hanged, Goering committed suicide. The remaining Nazis sentenced to death were hanged at Nuremberg on 16 Oct.

The court refrained from declaring 3 of the groups named in the indictment to be guilty. Those were the Reich Cabinet, the S.A. (mass militia of the Nazi party), and the high command. It was evidently reasonable to refrain from declaring the Reich Cabinet and the general staff criminal groups. These were bodies whose essential functions were *prima facie* legitimate. The number of persons involved, moreover, in the general staff and high command was small enough for the individual trial of implicated officers to serve the purpose more effectively than a declaration of criminality. The formations declared criminal were, firstly, the Leadership Corps of the National Socialist party; secondly, the *Schutzstaffel* and its offshoot the *Sicherheitsdienst*, better known under the initials S.S. and S.D., and, thirdly, the *Geheime Staatspolizei* or Gestapo. The first was the motive force of the whole ruthless policy of aggression, and therefore of all the crimes that followed upon that policy; the second were the assassins who served the brutal will of the tyrants; the third were the spies and torturers. Most of the 22 prin. defendants were found guilty, in

general terms, as members of the Leadership Corps, but each of them had many and grave particular charges to answer. In legal language, the court held that a criminal organisation was analogous to a criminal conspiracy in that the essence of both was co-operation for criminal purposes. The tribunal rejected the excuse of the Nazi leaders that Hitler was responsible for everything and it rejected the idea that a common plan would not exist because Hitler was the dictator. For 'Hitler could not make aggressive war by himself; he had to have the co-operation of statesmen, military leaders, diplomats, and business men.' The tribunal in the course of its judgment came to the following important decisions (*inter alia*): continued planning with aggressive war as the objective was estab. beyond all doubt; certain of the defendants planned and waged aggressive war against 12 nations; war crimes were committed on a vast scale never before seen in the hist. of war.

In declaring that aggressive war was the 'supreme international crime' for which individual heads of state could not escape punishment by seeking refuge in their sovereign rights the Nuremberg Military Tribunal in effect pronounced the judgment of the world's conscience upon an indictment without parallel in recorded hist. The proposition that 'the principle of international law, which under certain circumstances protects the representatives of a state, cannot be applied to acts which are condemned as criminal by international law,' is perhaps the most far-reaching laid down in the Nuremberg judgment; for it means that henceforth the law recognises no wholly irresponsible rule in the world; and absolute rulers whose acts cannot be challenged in their own countries may yet, in certain circumstances, be arraigned before a court of higher jurisdiction. As to the evidence, it may be said that never previously in hist. has a disintegrating major power, in surrendering, yielded practically all its state secrets, military, political, and economic from confidential speeches of its leaders down to their secret diaries and private correspondence. But manifestly time will be required to prepare a full official pub., with expert commentaries, on so great a mass of material, and the great lesson in contemporary hist., which the full range of these documents contain, could not be learned at the N. T.; for it was not the task of the tribunal to present to the world an authentic, fully documented account of those 12 years. Its task was to judge and to sentence 22 war criminals and pronounce on a number of groups or formations, and the prosecution made use of these documents which happened to be in allied hands only where and when they helped to substantiate particular points in the charges.

In addition, a number of German commanders were tried in 1948 by a U.S. military tribunal (not at Nuremberg) which gave judgment (27 Oct.) in the case of 3 field marshals, 9 generals, and an admiral for alleged war crimes. The

judgment, delivered by Judge Young (president) and Judge Harding, quoted at length from the findings of the international tribunal which sentenced Goering and his associates and said that the American tribunal would not fix a general rule, but only determine the individual guilt or innocence of the defendants. Staff officers (continued the judgment) had played an indispensable part in spreading the evil which originated with Hitler and the Nazi leaders, but to find an individual criminally guilty he must have passed the order (the indictments charged the prisoners with carrying out such orders as to execute commissars or the compulsory recruitment of Fr. labour, etc.) to the chain of command, and the order must be on the face of it criminal. Among those tried were F.-M. Wilhelm von Leeb, who was commander-in-chief of Army Group N. against Russia until Jan. 1942, when he resigned. He was found guilty of war crimes against civilians and was sentenced to 3 years' imprisonment, but released immediately. F.-M. von Keuchler was declared guilty of crimes against belligerents and civilians and was sentenced to 20 years; Lt.-Gen. Hermann Reinecke, a member of the Nazi party, convicted of criminal segregation of prisoners of war for 'liquidation' or turning them over to the Gestapo, and Lt.-Gen. Walter Warlimont, who had a big part in bringing out and enforcing the order to execute captured prisoners of war and in plans of incitement to lynch captured airmen, were sentenced to imprisonment for life. Sev. other generals were sentenced to terms of imprisonment.

At the end of Aug. 1948 the Brit. War Office announced that the gov. had decided to bring F.-M. von Brauchitsch, F.-M. von Rundstedt, F.-M. von Manstein, and Col.-Gen. Adolf Strauss to trial as war criminals by a military court in the Brit. zone of Germany. F.-M. von Manstein was then 61; his trial took place at Hamburg (Oct.-Dec. 1949) and he was sentenced to 18 years' imprisonment (see R. T. Paget, *Manstein: His Campaigns and His Trial*, 1951). F.-M. von Brauchitsch (aged 67) d. in a Brit. military hospital at Hamburg on 18 Oct. 1948.

Following the first great trial, 12 separate cases were heard by U.S. military courts. The final case was that in which 21 Ger. diplomats, civil servants, industrialists, economists, and others, judged by a U.S. military tribunal at Nuremberg, were sentenced to varying terms of imprisonment on 15 April 1949. The accused were charged under Control Council Law (No. 10) enacted by the Allied Control Council on 20 Dec. 1945, and Article II, section 2, declared that any person who was principal or accessory was guilty of a crime outlawed by the law. The fact that a person acted under orders did not free him of responsibility for a crime, though it might be considered in mitigation. It was apparent that the success of the Nazi programmes depended largely on the men holding positions of authority in the various gov. depts. The tribunal concurred in, and applied the

principles laid down by the International Military Tribunal (see above in the judgment in the leading trial). See P. de Mendelssohn, *The Nuremberg Documents: Some Aspects of German War Policy, 1939-1945*, 1946; Sir I. Maxwell Fyfe (ed.), *War Crimes Trials*, 1948; Lord Russell of Liverpool, *The Scourge of the Swastika*, 1954.

**Nürnberg**, see NUREMBERG.

**Nurraggi**, see NURAGHE.

**Nursery Rhymes**, jingling rhymes invented for the amusement of children, or in some cases survivals of anct folklore, invocations or incantations preserved from remote antiquity. Many of them are without doubt survivals from O.E. May Day celebrations, ring-songs, and dances which were once practised by grown-up people. The jingling metre and doggerel rhymes, in which the sense is often sacrificed to the attempted rhyme, have been handed down orally from one generation of children to another. The verses generally consist of a rhyming couplet or a quatrain in which the second and fourth lines rhyme, and there is frequently a refrain accompanying the quaint old airs which have been handed down as their setting. The nursery rhyme proper, embodying a tale set forth simply, and marked by either wit or pathos, is almost peculiar to the Eng. tongue; the equivalents in the Lat. or Teutonic tongues are more ornate and fantastical. The 'counting-out' rhymes, in which one word is dropped for each player and the one on whom the last word falls drops out from the ring, form a most interesting branch of folklore, and are undoubtedly of great antiquity. See R. Chambers, *Popular Rhymes of Scotland*, 1826; J. B. Ker, *An Essay on the Archaeology of Popular English Phrases and Nursery Rhymes* (new ed.), 1837; J. O. Halliwell-Phillips, *Nursery Rhymes of England*, 1842, and *Popular Rhymes and Nursery Tales*, 1849; E. Holland, *Rimes et Jeux de l'enfance*, 1883; W. W. Newell, *Games and Songs of American Children*, 1884; Louey Chisholm, *Collection of Nursery Rhymes*, 1911; E. Ithys and A. Daglish, *The Land of Nursery Rhyme*, 1932; L. Derwent, *Nursery Rhyme Anthology*, 1938; Iona and Peter Opie, *Oxford Dictionary of Nursery Rhymes*, 1951.

**Nursery School**. The N. S. in Britain is intended to provide for the healthy physical and mental development of children between 2 and 5 years of age. Its purpose is twofold: nurture and education. Welfare centres are concerned with the health of the infant up to the age of 2. The school doctor examines the 5-year-old when he enters the primary school, but until the advent of the N. S. there was no proper provision in Britain for the 2,000,000 children between the ages of 2 and 5. In 1918 the minister of education, H. A. L. Fisher, attempted to bridge this gap. Realising the serious degree of physical defect apparent in children on their admission to school, he warmly advocated the estab. of N. S.s in all areas. During the year ending Mar. 1919, 13 N. S.s were

recognised by the then Board of Education. These consisted mainly of voluntary pioneer schools which had been established before the passing of the Act. Then came the national call for economy. The N. S.s in existence were regarded as costly institutions, and the establishment of further schools was not recommended by the board. Margaret McMillan (q.v.), the pioneer of this movement, had long foreseen that the cost of the small school was likely to prove a stumbling-block. She had always advocated the large open-air school, but the authorities had declined to follow her lead, because they feared the spread of infection if large numbers of the 'unprotected' little ones were gathered together, and they considered that ideal home conditions could more readily be realised in the small school. By her experiment at Deptford, Margaret McMillan proved conclusively that a large N. S. of 260 children could be maintained at the low annual cost of less than £12 per child, and that with open-air conditions there is no undue risk of infection. In Dec. 1929 a circular was sent out from the Minister of Health and the President of the Board of Education concerning the welfare of the pre-school child. The essentials for healthy development at this age were summed up as follows: open-air conditions, sun and light, exercise and play, rest, food, and cleanliness. The local authorities were encouraged to establish and support open-air N. S.s where these needs could be met. During the years before 1939 a number of N. S.s were opened up and down the country and some colleges began to offer training for girls who wished to specialise in N. S. work. With the advent of the war, when fathers were called up and mothers urged into industry, the need for N. S.s became more urgent. Many war-time nurseries were opened jointly by the Ministries of Education and Health. These catered chiefly for the child of the working mother. Infant schools opened nursery classes for children from 3 to 5 years and with evacuation a large number of residential nurseries appeared. In 1944 the passing of the Butler Education Act made it necessary for local authorities to set up N. S.s where there was the demand, but in 1947 the building of new N. S.s was banned by the Ministry of Education. In 1945 the Minister of Education took over 315 of the war-time nurseries and organised them into N. S.s, but apart from these there have been few N. S.s, although day nurseries have once more been opened by the Ministry of Health for children whose mothers are working. In 1949 plans for 21 new N. S.s were passed for building, practically all in industrial areas. The high cost of building a N. S. has been considerably lessened by the realisation that N. S.s of the shelter type which were advocated by Margaret McMillan are a suitable form of accommodation for young children. To this end the N. S. Association has designed a new building, similar to those first erected in Deptford. A prototype of this design has been built at Cookham and has been taken over by the

Berks education authority. In view of the greatly reduced cost of building the prototype, other authorities are now planning N. S.s on similar lines and it is expected that many more will be built in different parts of the country, so helping to improve the present lamentable position, when only 1.10 per cent of British children between 2 and 5 years can find a place in a N. S.

The N. S. movement in America dates from the 1920's when Child Development Institutes came into being, and there has since been a rapid spread of N. S.s. The early N. S.s were supported by private funds, and laid most stress on physical health and habit training; but the modern approach is broader, based on psychological principles, and considers also the mental and emotional aspects of children's health. Although some N. S.s provide for children from the ages of 2 to 5, the 3 to 4 range is most common. There is usually 1 adult in charge of every 8 or 10 children. Greater emphasis is being laid on the relation between school and home, and between learning and play, and these trends are influencing education as a whole.

See Margaret McMillan, *The Nursery School*, 1930; Susan Isaacs, *The Intellectual Growth of Young Children*, 1935, and *The Nursery Years*, 1947; *Health and the Nursery School*, 1949; *Designing the New Nursery Schools*, 1950; E. Balint, *A Nursery School Group*, 1952; M. Rudolph, *Living and Learning in Nursery School*, 1954; Nursery School Association, *Nursery Schools To-day*, 1954; *The Educational Value of the Nursery School*, 1954; Dorothy May, *Nursery School Education*, 1957. See also KINDERGARTEN.

**Nursing.** Sick N. has evolved into a highly skilled profession since the Crimean War. In ancient times there were in existence hospitals, or at least some kind of dispensary system, for the sick poor in Egypt, India, Greece, and Rome. Essentially, however, organised N. as a branch of medical treatment may be said to have taken its rise amongst the deacons of the early Christian Church. From the 4th cent. on the development of N. was rapid, and the institutions were managed by the clergy, and the nurses recruited from the male and female monastic orders. The oldest institutions in England are St Thomas's and St Bartholomew's Hospitals, and their names indicate their religious connection. The Reformation caused a secular system to be introduced. Any measure of systematic N. was not attempted until the middle of the 19th cent. and until then all the skill that nurses possessed was acquired in the course of their work in the wards. Germany saw the birth of the new system at the foundation of the Institute of Pastor Fliegener in 1836 at Kaiserswerth; and it was at this place that Florence Nightingale (q.v.) was trained. Pastor Fliegener's institute was soon followed by the formation of societies in Philadelphia (1838) and in London (1840). The latter was founded by Mrs Fry, and the nurses were trained at Guy's and St Thomas's Hospitals.

Between 1842 and 1851 sev. schools were formed on the Continent.

The pub. of the horrors of the Crimean War gave a new impetus to the profession, and raised it considerably in the public esteem. Florence Nightingale with a band of trained nurses undertook the administration of the hospitals, and reformed them, besides nursing the sick. As a result, too, in 1860 the Nightingale Fund Training School for Nurses was founded at St Thomas's Hospital, with public subscriptions given in recognition of her great work; and all over the Continent similar schools were soon estab. The practice of preventive medicine and the advance of medical science generally have made it essential that nurses should be highly skilled and trained.

*Nursing as a profession.* N. ranks high as a profession for women, since it has an essentially feminine appeal. It gives opportunity for service, combined with the prospect of professional standing and an assured future with adequate salary and pension rights. The profession is also open to men. The number of male nurses has increased very considerably of recent years. Training is available to men in a number of general hospitals and mental hospitals, lists being obtainable from the Ministry of Health and the General N. Council for England and Wales.

To train as a nurse it is necessary to possess good health, an even temperament, and a spirit of service. The usual age of entry is between the ages of 18 and 30 years. Entry to hospital is by way of a preliminary training school attached to the hospital, or in the case of the smaller hospitals through a central preliminary training school. This period varies from 8 to 12 weeks, and at its completion the student enters the hospital and continues training in the wards and depts. The length of training varies; in some hospitals it is 3 and others 4 years. Three years is the period required by the General N. Council for England and Wales, the statutory body responsible for the training and professional education of the student nurse. This body regulates and sets the preliminary state examination which can be taken in 2 parts. Part I (theoretical) may be taken on completion of a pre-nursing course, arranged by many schools, and is taken at the completion of general education and prior to entering the preliminary training school, or at the completion of 6 months' training in the hospital. Part II (practical) is taken after 12 months' training. The final state examination is taken at the completion of 3 years' training. The successful candidate then becomes a state-registered nurse and her name is entered on the register kept by the General N. Council. Many hospitals now give training under a system known as the 'block system of training,' which means that the student takes the theoretical part of training away from the wards; during the time in this school of N. she works entirely as a student, returning to the wards again after a period of about 6 weeks. Other hospitals have a modification of this sys-

tem and others have a study-day a week. Many hospitals have adopted a straight span of duty, the 24 hours being split into 3 spans of 8 hrs each. The General N. Council frequently approves schemes of associated training between a general hospital and some special hospitals, e.g. children's, mental, T.B., etc. Other schemes cater for reduced periods of training by reason of previous specialised training. Reciprocity of training exists with many countries overseas, particularly Canada, the U.S.A., and S. Africa.

The young nurse in training at the present day has a much more free life than her sister of 20 years ago. She has student status, her practical work and her study are better balanced, and she has plenty of time off for relaxation. Nevertheless under the Brit. system, in contradistinction to the continental and Amer. method, the young nurse is not wholly a student. She is made to feel herself a part of the hospital staff and to take a gradually increasing share of responsibility for her patients' well-being.

At the completion of training many opportunities present themselves to the state-registered nurse. The post of staff nurse in hospital prepares for greater responsibility and higher posts such as that of ward sister, assistant matron, sister-tutor, and matron. There is the Queen's Institute of Dist. Nurses, for those who like to nurse the sick in their own homes and who like to work from their own home. Private N. appeals to many. At the present time great emphasis is laid on the preventive side of medicine, and there is a wide field for work as health visitors, school nurses, and industrial nurses. Interesting work is available with any of the services attached to her majesty's forces (see MILITARY NURSING SERVICE), and in the field of medical missions. Many post-graduate courses are arranged. A diploma of N. can be taken at the univs. of London and Leeds. The sister-tutor's diploma is awarded by the univ. of London. Courses are also arranged for hospital administration, the qualification of health visitors, etc. Training for qualification of midwives is controlled by the Central Midwives' Board. Part I training qualifies a nurse to act as a maternity nurse, working with a doctor, and Part II gives the qualification as a state-certified midwife.

Salaries and emoluments are controlled by a Whitley Council and an overall salary is paid, the nurse repaying the hospital for board and residence. The nurse pays a share of the superannuation contribution.

Certain hospitals have training schools (q.v.) for assistant nurses, those who qualify becoming state-enrolled assistant nurses. The nurse's name is then entered on the roll kept by the General N. Council. This training covers a period of 2 years and is designed for those who cannot take the full training for state registration.

Salaries alter from time to time, but the following table gives the 1956 figures:



<i>Gross Salary</i>	<i>Repayment to Hospital</i>
Student Nurses:	
1st year, £260	£119
2nd year, £270	£119
3rd year, £285	£119
Pupil Assistant Nurses:	
1st year, £260	£119
2nd year, £270	£119
Enrolled Assistant Nurses:	
£374 × £15-£479	£146
Staff Nurses:	
£417 × £15-£462; further increments of £20-£522	£153
Ward Sisters:	
£487 × £20-£607 by final increment to £615	£164
Sister Tutors:	
£630 × £20-£730	£193
Principal Tutors:	
£710 × £20-£810, and further increment of £25-£835	£193
Matrons vary considerably according to the size of hospitals.	
Minimum, £710-£845	£219
Maximum, £1095-£1290	£279

Salaries for sister-tutor, assistant matron, and matron are reviewed from time to time. Salaries for male nurses are approximately £10 per annum higher than above.

The status of the nurse is protected by the Nurses' Bill of 1943, by which Act it is an offence for any person to call herself/himself nurse who is not a state-registered or state-enrolled assistant nurse. The Nurses' Bill, which was before Parliament in 1949, is an Act to reconstitute the General N. Council for England and Wales and otherwise to amend the Nurses' Acts, 1919-45, to establish standing nurse training committees, registration of nurses trained abroad, etc. The professional negotiating organisation for nurses is the Royal College of Nursing. The National Council of Nurses of Great Britain and N. Ireland is an association of affiliated organisations through which the member bodies are affiliated to the International Council of Nurses. The Brit. Red Cross Society and the St John Ambulance Brigade arrange for lectures in home nursing and first aid. Members of the detachments are taught practical first aid and N. procedures. These societies have given very valuable help in augmenting hospital staffs most particularly during the two world wars.

**Home nursing.** Treatment of illness or injury in the home is usually by the non-professional, though also by the dist. nurse. Some knowledge of home N. is indispensable in every household, and is particularly necessary in homes where there are young children. Although some knowledge of medicine and hygiene is required, the essential qualifications for home N. are common sense, sympathy, and resourcefulness. The same qualities of obedience and loyalty which are demanded of the hospital nurse are demanded of the home nurse. If she is

sensible and capable she can do much to further the work of the doctor by carrying out his orders exactly and efficiently. Her actions can make or mar his prescribed treatment. For details of training in home N. see manuals of the Brit. Red Cross and St John Ambulance Societies.

The home nurse is usually dealing with patients who are not so ill as those under the treatment of the hospital nurse, and much of her work is connected with restoring her patient's confidence and interest in life, as well as health. She avoids fussiness and is always tactful and optimistic. She coaxes her patient to health, taking care not to give the appearance of bullying or forcing. Her task is complicated by the fact that her patients are usually members of her own family; she has no need, like the hospital nurse, to treat them consciously as individuals. Her effort has rather to be directed in the opposite direction, in the curbing of over-emotionalism, even though her firmness concerns those to whom she is related. See Lois Onkes and T. Davie, *A New Dictionary for Nurses*, 1943; Gladys Danby, *Elementary First Aid for the Housewife*, 1947; Mary Hutton, *Teach Yourself Home Nursing*, 1950; C. Woodham-Smith, *Florence Nightingale*, 1820-1910; Bettina A. Bennett, *A Guide to Professional Nursing*, 1951; Evelyn C. Pearce, *General Textbook of Nursing*, 1953; Hilda M. Gratton, *The Practice of Nursing*, 1954; W. G. Sears, *Medicine for Nurses*, 1954; Lucy R. Soymer, *General History of Nursing*, 1954; D. F. E. Nash, *The Principles and Practice of Surgical Nursing*, 1955; J. Moroney, *Surgery for Nurses*, 1956; Brit. Red Cross Society, manuals of *First Aid and Home Nursing*.

**Nursing in London.** Central Council for District. The C. C. for D. N. in L. was formed in 1914 with the object of promoting the adequacy and efficiency of dist. nursing generally and throughout the administrative co. of London. In its constitution standing orders provide for appointment by 50 organisations (associations employing nurses and other bodies directly or indirectly concerned with the dist. nursing service) of 116 members, and for a president, 2 vice-presidents, a chairman, and a vice-chairman, who are *ex officio* members of committees. These orders also provide for administration through an executive and a finance committee, appointed annually by the council in full session, each committee electing its own chairman.

The National Health Services Act of 1946 empowered Local Health Authorities to provide a dist. nursing service by directly appointed nurses or by employing the existing organisations. The latter course was chosen for the co. of London and by a special arrangement, not adopted elsewhere in the country, 25 associations, each administered by a local committee with a long tradition of careful efficiency, supplement generous official grants by an agreed proportion of voluntary income. By this means they preserve a large measure of freedom and reasonable economy in management. The

C. C. for D. N. in L. has always had close touch with official bodies, maintaining its present independent and voluntary status, and was asked to organise the dist. nursing service for the co. of London when the Act came into force in 1948. Thus the link between the voluntary and official institutions remained unbroken and the C. C. for D. N. in L. continues the work of co-ordination for which it was formed. One of the earliest concerns of the C. C. for D. N. in L. was the delimitation of associations' boundaries and the production of a *Directory and Streets List* indicating the association serving each street in the co. and the bor. to which the street belongs. This directory, revised and reprinted many times, is of great assistance to social workers in London.

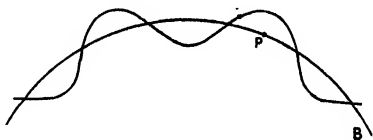
**Nut**, Egyptian goddess, personification of the sky; according to Heliopolitan theology daughter of Shu, the air, and sister-wife of Geb, the earth; the universe was thus often represented as Shu holding N. above him, while Geb lies at his feet. Confused with Hat-hor (q.v.), an earlier sky-goddess, N. was sometimes represented as a heavenly cow. One idea was that the sun as a child (or a calf) entered N.'s mouth to be born from her lap each morning. When coffins were made to resemble the universe, N. was represented on the inside of the lid, with the stars, one of which the deceased was thought to become.

**Nut**, indehiscent fruit, containing one seed only in a hard pericarp. Most N.s are rich in oils and starches, and their value as food has received much attention in recent years. Many nutritious articles of diet, including butter substitutes, are prepared from them. The most important are the coco-nut, brazil, walnut, chestnut, hazel, cashew, and pea-nut (qq.v.). See also GROUNDNUT. See F. N. Howe, *Nuts: their Production and Everyday Uses*, 1948.

**Nut-galls**, see GALL-WASPS.

**Nutation**. It has been shown under precession (q.v.) that this is caused by the gravitational attraction of the sun and moon—the latter especially—on the equatorial bulge of the earth. The motion of the equinoxes would be uniform if the orbit of the moon coincided with the plane of the ecliptic and if the moon moved in a circular orbit round the earth and the earth also moved in a circular orbit round the sun. But as none of these occurs the gravitational attraction of the sun and moon on the earth's equatorial bulge varies, and in consequence the poles of the equator do not describe an exact circle round the poles of the ecliptic. Each pole travels along a wavy path as shown in the diagram where *AB* represents a small portion of the circle which a *mean pole* describes around the pole of the ecliptic. If any point *p* on the mean curve be taken as a centre and an ellipse be constructed with a major axis  $18^{\circ}.5$  directed towards the pole of the ecliptic, and a minor axis  $13^{\circ}.7$  coinciding at the instant with the tangent to the circle at *p*, the true pole *P* moves along the ellipse, completing its course in 18 years 220 days.

The true first point of Aries will differ from its mean position except when the point *P* representing the true pole is at either end of the major axis of the moving ellipse. A very good illustration of N. is found in the case of a spinning top; as its speed of spin slows down its head can be observed to 'nod' (hence the word N. from the Lat. *nutare*, to nod) while the centre of its head can be regarded as describing a *mean circle*. N. was discovered by Bradley (q.v.) soon after he had discovered



aberration (q.v.). Certain corrections must be made for the positions of the stars, taking precession, N., and other effects into consideration. The variations in the declinations of the sun and moon give rise to the *Solar Nutation* with a period of half a tropical year, and a *Fortnightly Nutation* with a period of half a month, respectively, each of these contributing a term to the formula for the computation of the N. at any time. *The Nautical Almanac, The American Ephemeris and Nautical Almanac*, and similar pubs. in other countries, supply tables for these corrections which are facilitated by the use of the *Besselian Day Numbers* and also by the *Independent Day Numbers*.

**Nutcracker**, or *Nucifraga*, genus of birds of the crow family, *N. caryocatactes*, occasionally visits Britain. It is about the size of a jackdaw, having a brown back, with a long white spot on each feather, dark brown head, white tipped outer tail-feathers, black feet, and a black bill. In flight and habits it resembles the jay. It feeds on fruit, a variety of insects, and also the eggs and young of small birds. The nest is a big, clumsy structure, and in it about 3 eggs are laid, which are very light green, spotted with pale brown.

**Nuthatch**, or *Sitta europaea*, passerine bird fairly common in the S. half of England and in Europe. Its plumage is bluish-grey above, and the under surface is light reddish-brown or buff; the throat is white, and the tail-feathers have white tips. The bill is powerful and wedge-shaped, and is used to force away the bark in the search for insects, as well as to break nuts. It is a skilful climber, able to descend a tree head downwards. As in other tree-climbing birds, its first toe is much developed. The nest is made commonly in a hole in a tree, and the mouth of it is plastered up with mud, except for a hole just big enough to give the bird admittance. In it are laid about 7 white eggs, spotted with reddish-brown.

**Nutley**, tn. of Essex co., New Jersey, U.S.A. Plush, paper, metal products, cutlery, pharmaceutical preparations, beverages, and textiles are manuf., and it

has poultry, truck, and dairy products. Pop. 27,000.

**Nutmeg**, kernel of the fruit of sev. species of *Myristica*, of the family Myristicaceae, tropical trees or shrubs, natives of Asia, Madagascar, and America. The fleshy part of the fruit is rather hard, and is often eaten as a sweetmeat, resembling candied fruit; the nut is enveloped in a curious yellowish-red aril, the mace. N.s. yield a peculiar yellow fat, called oil of mace, and by distillation an almost colourless essential oil. See also MACE OF THE NUTMEG.



From M. Wilson: 'Good Company'  
(Oxford University Press)

#### A NYAKYUSA TRIBESMAN

**Nutmeg State**, see CONNECTICUT.

**Nutria**, see COYPU.

**Nutrition**, the science which studies the requirements of the body and the nutritive value of foods. See also BLOOD; CALORIE; CIRCULATION; DIGESTION; FOOD AND DIET.

**Nuts**, see SCREWS, BOLTS, AND NUTS.

**Nux Vomica**, seeds of a small evergreen tree, *Strychnos Nux-vomica* (family Loganiaceae). The seeds are circular and disk-like, about the size of a halfpenny, and covered with soft fawn hairs. The tincture of the Brit. Pharmacopoeia is made by treating with rectified spirit the seeds when finely powdered. The tree occurs in Indian forests as well as in the N. parts of Australia. The rind of the fruit is brittle, and the pulp white and gelatinous, and a number of seeds are produced in each fruit. They have been used to produce a brown dye. The

existence in them of strychnine and brucine was not discovered until the early part of the 19th cent.; their presence accounts for the value of N. V. as a tonic.

**Nyakyusa**, Bantu people of S. Tanganyika, living in Tukuyu dist., and numbering some 230,000. They are cultivators, the staple crop being plantains. They have a peculiar vil. organisation, the men of each vil. being men of the same age who have been brought up together in one neighbourhood. Young men of the same age found new vils. and then marry at more or less the same time. They have been well described by M. Wilson, in *Good Company*, 1951, and *Rituals of Kinship among the Nyakyusa*, 1957.

**Nyamwezi**, one of the largest Bantu peoples of Tanganyika, living on the plains surrounding the tn of Tabora. They suffered greatly from Arab slavers, but to-day are peaceful and prosperous.

**Nyanja Dialects**, see NEGRO-AFRICAN LANGUAGES, Bantu.

**Nyanza**: 1. See ALBERT, LAKE; EDWARD, LAKE; VICTORIA, LAKE. The lake formerly known as Albert Edward N. is now known as Lake Edward.

2. Prov. of Kenya, cap. Kisumu.

**Nyasa**, or **Nyanja**, large lake in Nyasaland, central Africa, discovered by Livingstone in 1859. Its greatest length is 350 m., and its breadth from 15 to 45 m., with a total area of 14,000 sq. m. It lies 1650 ft. above sea level. The lake has abundance of fish, and is drained by the Shire into the Zambesi. Transport on the lake is by native craft and also by modern steamship.

**Nyasaland Protectorate**, strip of ter. about 320 m. in length and varying from 50 to 100 m. in width, lying approximately between lat. 9° 45' and 17° 16' S., and long. 33° and 36° E. A recent survey puts the area at 47,949 sq. m. (land area 37,374 sq. m.). Pop.: Europeans, 2500; Asiatics, 3350; natives, 2,300,000. N. is an integral part of the Federation of Rhodesia and Nyasaland (q.v.), and is represented in the Federal Parliament by 4 Africans and 2 Europeans. N. P. comprises the W. shore of Lake Nyasa, with the tablelands separating it from the basin of the Loangwa R., and the region lying between the watershed of the Zambesi and Shire R.s on the W., and the lakes Chiuta and Chilwa and the Ituo R. (an affluent of the Shire) on the E., including the mt. systems of the Shire highlands and Manje. N. P. is bounded on the N. by Tanganyika Ter., on the S. and E. by Portuguese E. Africa, and on the W. by N. Rhodesia. Since the Federation came into being in Sept. 1953, certain matters, including defence, immigration, transport and communications, external affairs, currency, health, and customs and excise, are dealt with by the Federal Gov. Other matters such as African education and emigration remain the responsibility of the protectorate gov., which is composed of the governor assisted by an executive council composed of 4 official and 2 unofficial members. The laws of the protectorate are made by the governor

with the advice and consent of the legislative council, consisting of the governor as president, 10 official members, 3 of whom are *ex officio*, and 12 elected unofficial members (6 African and 6 non-African). The chief towns are Blantyre, Zomba (the seat of gov.), and Limbe (q.v.). There was some opposition by sections of the local inhab. to joining the Federation and some of the dissidents (1956) profess to fear that federation is not in the interest of Nyasaland. It is submitted that capital investment now

prevalent in N. P. and there are 12 clinics administered by missions and assisted by gov. grants. Medical services are well organised, with a large African staff and a number of Asiatic surgeons. There are 2 European hospitals, 15 native hospitals, and 100 rural dispensaries.

There is as yet no mineral development in N. P. as there is in Kenya or Tanganyika, though there are unexploited bauxite deposits on the Mlanje plateau. Labour in E. Africa is attracted to mining in S. Africa and N. Rhodesia, the result being that the proportion of natives seeking work in other parts of the continent has created a problem of grave concern to the gov., leading, as it does, to a reduced taxable capacity and to detribalisation. Tobacco is the crop most favoured by Europeans. It was first planted in 1889 and exported in 1893, 24·2 million lb. being exported in 1954. Tea is cultivated and varies from 6500 to 7500 tons annually. Cotton crops vary widely but reached 21·6 million lb. in 1953. Tung oil production is increasing; in 1954 18,000 ac. were planted and in that year yielded 900 tons valued at £106,000. N. P. is comparatively well wooded, the forests occupying 11·8 per cent of its area. The area of the forest reserves is about 2600 sq. m. and covers the chief catchment areas and watersheds. There are a number of African foresters and forest guards, and forestry is for the most part administered by the native courts.

**Communications.** The port of entry to N. P. is Beira in Portuguese E. Africa, which is also the most convenient port of entry for Rhodesia. There is a 3-ft 6-in.-gauge railway system extending from Beira (Portuguese E. Africa) to Chipoka on Lake Nyasa (496 m.), crossing the Zambesi R. at Sena (199 m.) by the Lower Zambesi bridge and passing through Murraco, Port Herald, and Blantyre (353 m.). Main roads and 'carrier' roads are open all through the protectorate, the total mileage being 3400. N. P. is connected by telegraph overland with the Cape via Salisbury. Central African Airways operate frequent services to connect up with international routes and all local central African services.

**Education.** The course for native authorities at the Jeanes School at Zomba represents a modern attempt to deal with the problem of training chiefs in their new duties. The attendance at European schools in N. P. has, however, diminished rapidly since 1935, when S. Rhodesia abolished all tuition fees and extended this privilege to children from N. P. In 1947 there were over 4000 native schools, and 2 secondary schools for Africans.

**History.** Livingstone, at the head of a gov. expedition, reached the S. shore of Lake Nyasa in 1859, and this visit resulted in the founding of various missionary societies. The activities of these bodies were followed in 1883 by the formation of the African Lakes Corporation, and 2 years later the first Brit. consul was sent out. Opposition by the new settlers to the slave trade carried on by Arab coastmen and natives settled at the N. end of



E.N.A.I.

NYASALAND: A MOTOR ROAD SKIRTING  
THE BASE OF MLANJE PEAK

attracted to Nyasaland spells an increase in the European pop. and therefore alienation of land from Africans. There is an intensified search for minerals in operation, and it is maintained that without minerals the protectorate cannot be self-supporting.

**Climate and products.** The climate of N. P. in its essential features is similar to that of the rest of SE. Africa within the tropics. The monsoon commences to blow strongly in Sept., and the first rains may be expected any time after mid Oct. From their commencement to the end of Dec. it is usual to experience violent thunderstorms and heavy precipitation in a few hours, followed by an interval of intense heat. Malaria is prevalent, especially after the rains, in many parts of the country, and occasionally is contracted in unexpected places, even in the highlands. Leprosy is

Lake Nyasa resulted in a conflict with the Chief Mlosi and the Yao chiefs. In 1889 the Brit. S. Africa Co. applied for a charter to trade in the country, and in the same year a large expedition was sent out under Maj. A. de Serpa Pinto to explore the Upper Zambesi and Lower Loangwa, and Sir H. H. Johnston arrived at Mozambique as consul with the special duty of composing differences with the Arabs of the interior. Treaties were concluded with the Makololo chiefs and with the Yaos round Blantyre and, following a brief encounter between Serpa Pinto and Maluri, a powerful Makololo chief, the Brit. Gov., on 21 Sept. 1889, proclaimed a Brit. protectorate over the Shiré dists. Johnston, in his journey up the lake, induced the 'Jumbe' or sultan of Kota Kota to put his country under Brit. protection and arranged similar treaties with Mlosi and other Arab and Wahonga chiefs. This work of Johnston was ratified in 1891 by an Anglo-Portuguese convention and, soon afterwards, a Brit. protectorate over the countries adjoining Nyasa was proclaimed. The protectorate of Nyasaland was confined to the Shiré and Lake Nyasa dists., the rest of the ter. under Brit. influence being placed under the Brit. S. Africa Co. In 1891 there were expeditions against slave-raiding Yaos at the S. end of the lake, while the next few years brought much trouble in the way of slave-trading and constant raids; but by placing 3 gunboats on the lake, the dispatch of Sikhs from India, and the recruitment of native troops, the slave trade was suppressed. In 1893 the name of the protectorate was changed to the 'Brit. Central Africa Protectorate,' but the old name N. P. was restored in 1897, by order in council amending the constitution. See also RHODESIA AND NYASALAND, FEDERATION OF. See H. L. Duff, *Nyasaland under the Foreign Office* (2nd ed.), 1906; W. F. Johnson, *Nyasa: the Great Water*, 1922; S. S. Murray, *A Handbook of Nyasaland*, 1932; L. S. Norman, *Nyasaland without Prejudice*, 1934; F. Debenham, *Nyasaland, Land of the Lake* (H.M.S.O.), 1955; Lord Hailey, *An African Survey*, 1957.

**Nyborg**, seaport on the E. coast of Fyn Is., Denmark, 17 m. ESE. of Odense. It is the terminus of the ferry to the is. of Zealand, and has a large oil depot. The castle, the oldest in Scandinavia (1170), suffered greatly from the attack of the Swedes in 1658; it was restored in 1923 and contains a museum. Pop. 11,320.

**Nyctalopia**, defect in the vision of people who can see distinctly in a faint light only, and not in bright daylight. The term is sometimes applied to the opposite defect of vision, by which some people are unable to see distinctly save in light of great intensity; this is 'night-blindness,' and is inherited as a Mendelian dominant character.

**Nyiregyháza**, tn. of NE. Hungary, cap. of the co. of Szabolcs-Szatmár, 126 m. ENE. of Budapest (q.v.). It is the centre of the *Nyírtég*, which is known for its tobacco and potatoes, and it has furniture, cement, brick, and vegetable-oil industries. Julius Benozur (q.v.) was b. here,

and the Báthori (q.v.) family belonged to the dist. Pop. 53,000.

**Nyírség**, see NYÍREGYHÁZA.

**Nyköping**, seaport and the cap. of Södermanlän, Sweden, at the head of the Byfjord, on the Baltic, 98 m. SW. of Stockholm. Fifteen national diets were held at N. in the 13th to the 15th cents. It has a good harbour, and exports iron and zinc ore, timber, wood-pulp, and oats. There are engineering and textile manufs. Pop. 21,724.

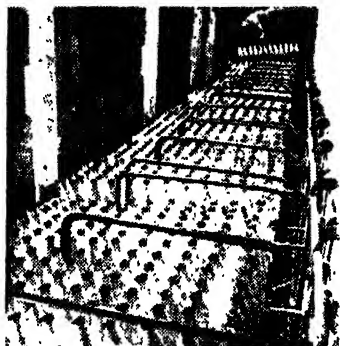
**Nylghau, Nilgai, or Blue Ox** (*Boselaphus tragocamelus*), large antelope, found in central India. The male is slate or dark grey, darkening with age, the legs are black; the female is fawn or reddish brown. On the throat is a white patch and below it hangs a tuft of dark hair. The male is over 4 ft at the shoulders, but the back slopes down, as the hind legs are shorter than the fore legs. The female is about a third smaller, and lacks horns, which in the male are black, short, and erect. Though in the jungle it is a wary animal, in the more cultivated dists. it is very tame. Natives regard it as sacred. Its skin makes valuable leather.

**Nylon**, generic name for a whole class of new materials. The name itself, which has no etymological significance, was invented by the Amer. firm (E. I. du Pont de Nemours Incorporated) in whose laboratories N. was first made. N. has no exact counterpart in nature, although its chemical composition is akin to proteins. It is a product with its own characteristics and can be made up into various forms: powders, solutions, sheets, strands, and yarns. The following definition of N. has been accepted at H.M. Patent Office: 'Nylon is a generic term for synthetic fibre-forming polyamides, i.e. organic condensation products which contain a multiplicity of structural units linked in series by amide or thioamide groupings, produced by a process of manufacture in which non-fibre-forming organic substances of lower molecular weight are converted into products of such high molecular weight as to be capable of being formed into filaments, which, on cold drawing, form a true fibre structure recognisable by X-ray examination.'

**Chemical basis.** The building up of very long chain-like molecules from short molecules, a process known as 'superpolymerisation,' can be effected in many different ways. A method in general use is to form a particular superpolyamide, '66' polymer, by heating adipic acid and hexamethylene diamine together; water is eliminated during the reaction. The resultant polymer is called '66' because each molecule of these reagents contains 6 carbon atoms. The raw materials from which the diamine and adipic acid for making '66' polymer are obtained include phenol from coal, oxygen and nitrogen from the air, and hydrogen from water; hence the popular, though over-simplified, statement that N. is made from coal, air, and water.

**Manufacture.** N. yarn, used for many different textile purposes, is manuf. by an extrusion process. The polymer chips are

poured into a hopper and melted; the molten polymer is then pumped downwards through a spinneret, a metal disk containing fine holes. The thin streams of liquid forced through these holes are cooled by air currents and so become solidified into continuous filaments which are wound on to a cylinder. The yarn is next subjected to the process known as 'cold drawing,' mentioned in the Patent Office definition above. By this process the yarn is drawn out to 3 or more times its original length. During this stretching operation, the long chain-like molecules



British Nylon Spinners Ltd

BOBBINS OF NYLON AWAITING FURTHER PROCESSING

which make up the filament become oriented, so that they lie mainly parallel to the fibre axis and close to one another. It is this drawing operation which gives to N. the properties of a textile fibre; before this takes place the filaments are simply extruded polymer. The yarn is now ready for further processing, which varies according to the particular purpose for which it is required.

**Properties.** N. yarn has a combination of properties unique among textile fibres. One of the most notable is remarkable tensile strength combined with lightness in weight and a high degree of resilience. The tensile strength of N. yarns can be regulated during manuf., but N. is normally made into yarns considerably stronger than other textile fibres of the same dimensions. Compared with metal wires N. is twice as strong as the same size of aluminium wire. No other textile fibre in general use can equal N.'s elasticity. N. yarns are elastic up to about 8 per cent stretch, regaining their original length quickly. Above 8 per cent stretch a slight but permanent elongation occurs. Besides being strong and resilient, N. shows remarkable resistance to abrasion. This unusual durability has set new standards in the wearing qualities of a wide range of textiles. N. yarns have comparatively low moisture absorption, and therefore dry with unusual rapidity. The wet strength of N. is unusually high,

approximately 85 per cent of its strength when dry. N. fabrics are particularly easy to wash and clean; dirt comes away rapidly from the smooth cylindrical fibres. N. yarns resist alkalis and hydrocarbons, soap solutions, oils, and petroleum. They are attacked by strong mineral and certain organic acids.

A special property of N. yarns is that fabrics made from them can be set to any desired permanent shape by heat treatment with boiling water or steam under pressure. These heat-set fabrics show little or no shrinking or stretching. The melting-point of N. depends on the chemical composition of the particular N. concerned. Melting-point for most N. textile fabrics is approximately 480° F. N. yarn does not blaze when brought into contact with a flame; it fuses, forming a round hard bead. N. itself is not attacked by insects, micro-organisms such as bacteria and fungi, or mildew.

**Uses.** N. became famous for parachute fabrics and women's stockings, but it is now used for over 150 textile purposes, both domestic and industrial. N.'s particular combination of properties makes this yarn especially suitable for a wide range of uses. There is now a great variety of N. apparel fabrics, woven and knitted, and more are being developed. N. ropes and cords are well estab. Other industrial uses include nets, filter cloths, heavy duty canvases, tyre cords, and transport upholstery.

**Centres of manufacture.** All the N. yarn made in Britain is produced at Pontypool, Monmouthshire. Earlier development had been in continuous filament yarns, but N. staple is now being produced in appreciable quantities; this has extended the range and variety of N. products, particularly of blends with other fibres. N. yarns can be woven, knitted, or braided on normal textile machinery, so they can be used on existing plants. See **PLASTICS**.

**Nymburk** (Ger. *Nimburg*), Czechoslovakia in the region of Prague (q.v.), on the Labe (see **ELBE**). It has hydro-electric installations. Pop. 11,500.

**Nymphaea**, water-lily, genus of aquatic plants, chiefly of the N. hemisphere, family *Nymphaeaceae*, about 40 species; *N. alba*, the Common White Water-lily, and *N. occidentalis*, the Lesser White Water-lily, are native to Britain and N. Europe; cultivated varieties and hybrids, chiefly of *N. alba*, *N. lotus*, *N. rubra*, *N. capensis*, *N. caerulea*, and *N. mexicana* are widely grown in gardens.

**Nymphæum** (Lat. 'a temple of the Muses'), a pleasure-chamber, containing flowers, fountains, and statues, in a Gk or Rom. mansion.

**Nymphs:** 1. In Gk mythology, lesser goddesses with eternal youth, connected with the forces of nature, and generally with some divinity of higher rank: Artemis, Apollo, Pan, and Hermes. They were divided into the Oceanids, N. of the open sea, and Nereids, N. of the inland seas; Naiads, who presided over rivers, brooks, and lakes; Oreads, N. of the mts and grottoes, among whom was Echo; and

Dryads or Hamadryads, who dwelt in the forests and trees. See F. G. Ballentine, *Some Phases of the Cult of the Nymphs*, 1904.

2. In zoology nymph means the immature form of an insect, e.g. dragonfly, resembling the adult; it must not be confused with a larva (e.g. a caterpillar) which has a form entirely different from the adult, and in which the eyes are simple.

**Nyon**, small tn of the canton of Vaud, Switzerland, on the W. shore of Lake Geneva, about 12 m. north of Geneva. It stands at the junction of the railway to Geneva and Lausanne with the lines running into France. It has porcelain manufs. N. was the old Roin. colony of *Julia Equestris*. Pop. 8000.

**Nyons**, see DRÔME.

**Nyren, John** (1764-1837), Eng. cricketer and writer on cricket, son of Richard N., cricketer and captain of the famous Hambledon Club, Hants. N. was a moderate batsman and a good fielder at point and middle wicket, but his fame rests on his account of the Hambledon players in *The Young Cricketer's Tutor*, ed. by Charles Cowden Clarke (1833). This book, which is generally regarded as the classic of cricket literature, led Andrew Lang to describe N. as the Herodotus of cricket. There were numerous later eds., including *The Hambledon Men*, ed. by E. V. Lucas (1907). N. was a good

musician and one of the circle who met at the home of Vincent Novello.

**Nysa** (Ger. *Neisse*), tn of Poland, in Opole prov., on the Silesian Neisse (q.v.), 30 m. SW. of Opole (q.v.). It was formerly in Upper Silesia (q.v.). It was the cap. of a principality of the bishops of Breslau (see WROCLAW), 1198-1810, and was badly damaged in the Second World War. Chemicals, textiles, and machinery are manuf. Pop. 15,000.

**Nysa** (Polish riv.), see NEISSE.

**Nystagmus**, eye disorder consisting of an involuntary oscillation of the eyeball which may be either lateral, vertical, rotary, or mixed. It is present in disease of the labyrinth or semicircular canals which control the balance of the body. It is also present in some degenerative diseases of the central nervous system, and is one of the signs in disseminated or multiple sclerosis (q.v.). N. sometimes occurs in miners and is known as 'miners' N. This occupational complaint is thought to be a neurosis. Air pilots are specially tested for N. before being allowed to fly. See also EYE.

**Nyx**, personification of night, called Nox by the Romans. N. and Erebus are the offspring of Chaos, and parents of Aether and Hemera, pure air and day. N. was also the mother of Nemesis. She was a winged goddess in a chariot, and her residence was in Hades.





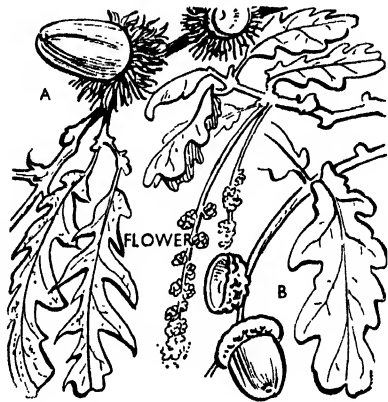
**O**, fifteenth letter of the Eng. alphabet, is the only vowel in the language which generally (but not always) corresponds in sound with the *o* of Ger., Fr., and other European languages. Besides the name-sound as in *cone*—a sound which is represented by a variety of spellings: *though*, *yeoman*, *roe*, *hauboy*, etc.—it has the short sound as in *lot*, and a third sound as in *none*, which links it with *u*. Indeed, A.-S. *as*, as well as *us* and *os*, is often transcribed in modern English by *o*. The N. Semitic alphabet, which was the prototype of the Greek, and thus of all the W. alphabets, had no vowel *o*; it was a purely consonantal alphabet (see ALPHABET). The Greeks obviated this difficulty by using the Semitic '*ayin*', representing a Semitic sound (a kind of guttural breath), which did not exist in Greek. The reason for using '*ayin*' for *o* is not quite clear; at any rate it was the last letter still available for the purpose. The Greek and the Latin *o*, as well as the *o* of all the European alphabets, resemble in shape the early N. Semitic '*ayin*' much more than the '*ayin*' in modern Semitic alphabets (Hebrew or Arabic). In the primitive Gk alphabet the letter was used for *o*, *ou*, and *ō*. Later another symbol was devised for *ō*, namely *Ω*, called *omega* ('the big *o*') in Gk grammars to distinguish it from *o*, or *omicron* ('the small *o*'). Yet *omicron* and *omega* were not true pairs, for *o* + *o* contracted to *ou* (cf. *doulo-omen*; contracted form *douloumen*) and *o* was really a close, whilst *ω* was an open, sound. See ALPHABET.

**Oahu**, see HAWAIIAN ISLANDS.

**Oak**. There are about 250 species of *O.* (*Quercus*) widely distributed throughout the world. The best known and most important commercially are European *O.s.*, including Eng. *O.*, Amer. *O.*, and Jap. *O.* Two European species, *Quercus robur* and *Q. petraea*, produce sev. varieties known as Eng. *O.*, Austrian *O.*, Slavonian *O.*, etc., and the quality of the timber varies according to the locality. In valleys with rich alluvial soil the predominating species is the Pedunculate *O.* (*Q. robur*), and a clear line of demarcation can often be distinguished when the Sessile *O.* (*Q. petraea*) takes the place of the Pedunculate at altitudes where the soil is poorer. The 2 trees are easily identified by the fact that the Pedunculate *O.* has its acorns borne on a long stem (botanically known as the 'peduncle'), while the Sessile *O.* has the acorns borne directly on the twigs.

The *O.* once covered large areas of Britain from Perthshire southwards, and has had a considerable influence on the development of the country, for its timber was vital to shipbuilding in the formative years of the country's sea-power. The last extensive planting occurred during the Napoleonic wars, but this stimulus to afforestation in Britain has ceased since

the middle of last cent. The *O.s.* are not remarkable for height. In close canopy they may attain 100 ft., but in the open they do not exceed 60 to 80 ft. But they are very massive, with great girth, rugged bole, gnarled crooked branches, and a great spread of crown. They reach a great age, sometimes over 1000 years, and perhaps more. The leaf of the *O.* is oval, with deep rounded lobes, and in autumn the tint changes from bronze to pale brown. The flowers are borne in small groups on stalks which later bear acorns,



OAKN

A, Turkey oak; B, English oak.

each fruit fitted into the familiar patterned cup formed of fused bracts. *O.* timber is not only very hard and durable, but, owing to its broad medullary rays, shows most beautiful silver-grain, flower, or flash when cut 'on the true quarter.' To the true cutting of the timber the beauty of the old *O.* panelling is due. But *O.* timber, on account of its slow growth, does not pay to cultivate in most parts of Britain, though in combining the good qualities of other timbers it is unrivalled for certain purposes. See also BOG OAK; FORESTRY; TIMBER.

**Oak-apple Day** (29 May), day of the restoration of Charles II to the Eng. throne in 1660, specially celebrated at the Royal Hospital (q.v.), when oak-leaves or oak-apples are worn in memory of the king, who took refuge in an oak-tree while fleeing from his pursuers (6 Sept. 1651).

**Oak-Fern**, see POLYPODIUM.

**Oak-gall and Oak-apple**. No plant is more subject to the attacks of gall-producing insects than the oak, and the abnormal production of plant tissue takes many forms, which are remarkably

consistent in their variety. The beautiful gall-wasp (*Cynips kollari*), for instance, invariably causes the marble galls on young oaks by laying its eggs, which hatch into the fat grubs found inside the galls. Another (*Dryophanta scutellaris*) causes the formation of small cherry-like galls on the under surface of the leaves, usually along the midrib. A gall produced by *Cynips tinctoria*, found in S. Europe, was formerly used on a large scale in the manuf. of ink, but is now displaced by superior chemical processes.

**Oak Park**, residential vil. in Illinois, U.S.A., adjoining Chicago on the W., with manufs. of food products, tools, and dies. Pop. 63,500.

**Oak Ridge**, area in Tennessee, U.S.A., given over to a section of the atomic bomb project, and officially known as the Clinton National Laboratory until 1948; now O. R. National Laboratory. The plant, which covers nearly 60,000 ac., was set up in 1943 for the production of plutonium, considerations governing the choice of site being its distance from the coast and the proximity of Tennessee Valley Authority water and power supplies. In 1948 O. R. Institute of Nuclear Studies was organised by 14 member univs. Pop. 30,300.

**Oakeley, Frederick** (1802-80), Eng. tractarian; youngest son of Sir Charles O., one time governor of Madras. Educ. at Christ Church, Oxford, he was chaplain-fellow of Balliol College, Oxford, 1827, and prebendary of Lichfield, 1830. He joined the Tractarian movement, and became incumbent of Margaret Chapel, London, into which he introduced ritualism (1839-45). In 1845 he followed Newman (q.v.) into the Rom. Catholic Church. He was an original canon of Westminster diocese from 1852 to 1880. O. trans. the Lat. hymn *Adeste Fideles* as 'O come all ye faithful,' 1841. He pub. theological works before and after his conversion.

**Oakham**, co. tn of Rutland, England, in the vale of Catmose, 11 m. ESE. of Melton Mowbray. O. castle (12th cent.) has a good Norman hall. There is a school founded in 1584; it now accommodates about 300 boys, its constitution having been reorganised on public-school lines in 1875. The tn is a centre for hunting. There are manufs. of boots and shoes and knitted garments. Pop. 4000.

**Oakingham**, see WORKINGHAM.

**Oakland**, third largest city of California, U.S.A., co. seat of Alameda co., on the E. coast of San Francisco Bay, 6 m. from San Francisco. It is an important seaport, and shipbuilding, fruit-canning, and tanning are the chief industries. It has lumber-mills, oil refineries, and plants producing glass, cereals and feeds, beer, wine, chemicals, and building materials. It also manufs. cotton, woollen, and steel goods. O. is the seat of Mills College, the College of the Holy Names, and the California College of Arts and Crafts; the Chabot Observatory is also here. Pop. 384,575.

**Oaks, The**, see HORSE-RACING.

**Oakey, Geoffrey Lawrence**, 1st Baron

(1880- ), Brit. judge, educ. at Haileybury and New College, Oxford. He was called to the Bar by the Middle Temple, 1908, and took silk in 1925. From 1932 to 1944 he was a judge of the King's Bench div. followed by 3 years as a Lord Justice of Appeal. In 1947 he was appointed a Lord of Appeal in Ordinary. As Lord Justice Lawrence he was the Brit. president of the International Tribunal which tried Ger. war criminals at Nuremberg in 1945.

**Oakum**, hempen fibre made from old ropes, the best kind being produced from tarred ship's rope. It is used as a surgical dressing in emergencies, and for stopping leaks and caulking seams in ship construction. The name was once used to denote tow, a part of flax fibre.

**Oamaru**, chief tn of N. Otago, S. Is., New Zealand, situated on the E. coast and on the main N.-S. highway, 78 m. from Dunedin, and 152 m. from Christchurch. In 1853 the land on which the tn now stands was acquired as a grazing run. It was proclaimed a municipality in 1866 with a pop. of approximately 1000. Most of the streets, which are planted with trees, are named after Eng. or Scottish rivs. Many buildings in the business portion of the tn are built of O. stone, from the limestone quarries in the dist. The local stone deposits are the source of flourishing lime industries producing both carbonate of lime and burnt lime. There are 4 flour-mills, a woollen-mill, a freezing works, and engineering and joinery works in the dist. O. has a good harbour capable of handling overseas shipping. It has plentiful supplies of water, electric power, gas, and soft coal. Besides the primary schools there are 4 fine residential secondary schools. The surrounding dist. is a prosperous agric. community closely settled and generally well farmed. Pop. 9787.

**Oarfish**, species of large ribbon-like teleostean fishes (*Regalecus glesne*), remarkable for its shape and internal organisation. They are among the largest fishes known, most specimens observed measuring 12 ft in length, while some are recorded to have exceeded 20 ft. Like that of other members of this family the body of the O. is exceptionally elongated and compressed, and sword-shaped, but in the O. this feature is emphasised, for the length of the body is some 15-fold its depth. The O. has no scales on its body, it has a small mouth and large eyes, and a compressed head like that of a herring; its very long and many-rayed dorsal fin, whose foremost rays are enlarged into a crest, extends from behind the head to the tail fin, which is rudimentary (or even absent). The long slender ventrals, by which the O. is distinguished from the other ribbon fishes, become long paddle-tipped filaments. The range of the O. in the ocean seems to extend over all seas from the Mediterranean and N. Seas to the S. Atlantic, and from the Indian Ocean to the coast of New Zealand. During the past cent. and a half a number of specimens have been found stranded on Brit. coasts.

**Oases** (sing. **Oasis**), isolated fertile regions in deserts, caused by the presence of water. This may be due to springs, pools, or damp hollows in water-courses usually dry, or water-courses from beyond the desert not yet dried up. They are generally arranged along the foot of a range of hills or mts, or an outcrop of rock. Some are of large area, and form the homes of tribes. Many are being created by means of artesian wells.

**Oast-house**, building containing kilns for drying hops. The hops are placed on horse-hair covered floors, which are heated from below, and the O. is so constructed as to allow a constant draught of warm air to pass through and out at the top. Circular O.s with conical roofs are a feature of the hop-growing dists. of Kent, England.

**Oastler, Richard** (1789-1861), social reformer, b. Leeds, was articled to an architect, but became famous as the protagonist of the Ten Hours Bill in the campaign for factory reform. In 1830 children were employed in the worsted-mills for 13 hrs a day with an interval of half an hour, and in the woollen-mills 15 hrs with an interval of 2 hours. The struggle, which was aggravated by the tremendous slump in hand-loom weaving through which parents were reduced to living on their children, ended in 1847 with the passing of the Ten Hours Bill, which limited the actual work of all between 9 and 18 years of age to 10 hrs a day, exclusive of meal times. His was one of the chief names associated with this reform, others being John Fielden, Michael Sadler, and Lord Shaftesbury.

**Oates, Lawrence Edward Grace** (1880-1912), Brit. explorer, b. Putney. He was wounded in the S. African war, and joined Capt. Scott's Antarctic expedition (1910), being one of the final party which reached the S. Pole. On 17 Mar. O., who had been taken ill and feared that he would be a hindrance to his companions, deliberately left his tent to die. Scott in his diary commented: 'It was the act of a very gallant gentleman.' See also SCOTT, ROBERT FALCON. See E. R. G. R. Evans, *South with Scott*, 1921, and L. C. Bernacchi, *A Very Gallant Gentleman*, 1933.

**Oates, Titus** (1649-1705), conspirator, b. Oakham. Son of an Anabaptist preacher, who had taken Anglican orders at the Restoration. O. was expelled from Merchant Taylors' School after a year and was sent down twice from Cambridge, first from Caius and then from St John's—of which college he afterwards claimed to have been bursar. Having taken holy orders, he held sev. curacies and a naval chaplaincy, from which he was invariably dismissed for vicious conduct. The same thing happened also when he entered the Rom. Church. It was at this juncture, in 1678, that he concocted his story of a popish plot to murder the king, burn London, and slaughter the Protestants. He perjured himself by making an affidavit before Godfrey, the magistrate, and in spite of the palpable inconsistencies in his evidence succeeded in creating a panic, which led

to the execution of many innocent Rom. Catholics, and in securing for himself a pension of £600 and a suite of rooms in Whitehall. The Duke of York and the queen were victims of his slanders. In 1685 he was found guilty of perjury and condemned to lifelong imprisonment with floggings. He regained his liberty and pension on the accession of William and Mary in 1688. See P. W. Sergeant, *Liar and Faker*, 1926, and Jane Lane, *Titus Oates*, 1949.

**Oates Land**, Australian Antarctic Ter., see ANTARCTIC AND ANTARCTICA.

**Oath**. An O. may be defined as a solemn declaration to a superior or divine being, or in the name of something held sacred, by which the declarant either undertakes to speak the truth or promises to do something in the future, on pain of calling down on his head divine or preternatural wrath. O.s of the former or assertory kind may be exemplified by the affidavit and the O. of a witness in a court of law; the latter or promissory kind by the O. of allegiance, by taking which a naturalised foreigner becomes a Brit. subject. By the Eng. law of evidence (q.v.) all oral testimony in any proceeding must be given upon O., except (1) under the Criminal Law Amendment Act, 1885, in the case of a child of tender years, where, in the opinion of the court, the witness does not understand the nature of an O.; and generally, in prosecutions under the various Acts for the prevention of cruelty to children, unsworn evidence of children may be accepted; (2) under the Oaths Act, 1888, every person who objects to being sworn on the ground either that he has no religious belief, or that the taking of an O. is contrary to his religious belief, may make a solemn affirmation in the prescribed form. The passing of the Oaths Act, 1888, was the result of the agitation of the celebrated Bradlaugh (q.v.), member for Northampton. The Act of 1888 effected the removal of the last of the tests for members of Parliament, the others being the O. of supremacy, the O. of abjuration, the O. of allegiance, and the declaration against transubstantiation. There were prior to 1888 Acts making provision for the taking of O.s by Quakers, Rom. Catholics, and Jews, but the Act of 1888 abolished the necessity for any religious beliefs in taking an O., whether by a member of Parliament or anyone else. At the present day the great majority of Eng. witnesses in the law courts still 'swear by Almighty God,' and kiss, or, since the Oaths Act, 1909, simply hold, a copy of the N.T. Jews swear on a copy of the Pentateuch, and keep their heads covered; Scots witnesses affirm with the hand uplifted, while Chinese witnesses require a saucer to be broken before their consciences will permit them to give evidence.

**Oats** as a food are very valuable, being well balanced in respect of protein, carbohydrate, and fat. They are rich in vitamin B1 and are valuable for all classes of stock, while their value for human food has gained increased recognition. Boiled with water in the Scots fashion, oatmeal

porridge is a substantial, nutritious, and appetising dish. The origin of the cultivated species is unknown, none of them occurring in a truly wild state. The wild oat (*Avena fatua*) is supposed to be the original species. Two main races are recognised, viz. common O. (*Avena sativa*), with open spreading panicles, and Tartarian O. (*A. orientalis*), with contracted one-sided panicles. The white and black varieties of the latter are more productive in warm climates, and are favoured for their tall stiff straw. The varieties of the common O. differ chiefly in the colour and thickness of the husk, the shape of the grain, the period of ripening, the length of the straw, and the tendency to shed the grain when ripe. Other species are weeds. The bristle-pointed O. (*A. strigosa*) and the short O. (*A. brevis*) are sometimes, like the common O., grown as green fodder.

**Oaxaca:** 1. Pacific state and city of Mexico, at the S. end of the isthmus of Tehuantepec. The state is mountainous, broken in the interior, and tropical on the coast. Its red soil is well watered, and mining (of precious and other metals; coal and petroleum occur) and agriculture are the chief pursuits. Indian corn, coffee, sugar, cacao, wheat, fruits, tobacco, rubber, and indigo are produced. Area 36,370 sq. m.; pop. 1,422,717.

2. Oaxaca de Juárez, cap. of O. state, a city built by the Spaniards on the site of the Indian cap. It is situated in the central part of the state, on the Río Atoyac, at the foot of the jagged peaks of the Sierras that stand between it and the sea, at an elevation of 5034 ft. It is 230 m. S.E. of Mexico City, with which it is connected by railway and the Inter-Amér. Highway. In 1943 a 200-m. highway from O. to Matamoros (Puebla) was formally opened, and there is an airfield. The modern city remains even more Spanish and Indian than Guadalajara, with its early churches, old houses, and the descendants of Zapotec and Mixtec Indians in traditional costume and sandals in its modern streets. Porfirio Díaz (q.v.) was b. here. The church of Santo Domingo, with an interior which is regarded as the most superb example of Baroque decoration in Mexico, was founded by the Dominicans in the 16th cent. Its ceilings and interior are covered with gold and polychrome reliefs of remarkable richness. La Soledad (temple to the Virgin, Our Lady of Solitude, O.'s patron saint) is another massive 16th-cent. building. The markets of O. are noted for silverwork, pottery, serapes, and fruit and vegetables. Some 4 m. W. of the city are the ruins of Monte Albán, which was evidently once the cathedral of a whole Zapotec diocese, 'a cathedral without a cathedral town' for the Indians who lived in the valley. The Mitla ruins in a vil. of the same name (the anct. cap. of the Zapotec Indians) lie 26 m. N. from O. The Spaniards took the valley of O. in the 16th cent., and O., a vassal of the Sp. crown, was given to Cortés, marquis of the valley of O., as a grant. As a Sp. city O. prospered from

the vast agric. areas of the valley, and the precious metals of the mines. O.'s part in the political vicissitudes of Mexico is indicated by the fact that from its foundation in 1486 to 1876 it was besieged and taken 17 times. Pop. 29,300.

**Ob'**, riv. in W. Siberia, rising in the Altay Mts (in 2 headstreams, Katun' and Biya) and flowing NW., then N. into the O. Bay (500-m.-long estuary) of the Kara Sea. Length from confluence of Katun' and Biya 2300 m., from the source of its main trib., the Irtysh (q.v.), 3500 m.; drainage area over 1,100,000 sq. m. Apart from the extreme upper reaches the O. is a typical plain riv., wide and slow, with many arms and is. It flows mostly through a marshy, forested area (see Naryn). The main tribs., besides the Irtysh, are the Chulym and the Tom'. The O. is navigable throughout its course and is chiefly used for transportation of timber, grain, and coal. The chief ports are Novosibirsk and Barnaul. Novosibirsk hydro-electric station (built 1954-7) is the first to exploit O.'s resources. O. was first visited by Novgorodians in the 11th cent., and was colonised by the Russians from the 16th cent. O. basin is an area of banishment (since the 17th cent.), labour camps, and rapid economic development.

**Obadiah** ('servant' or 'worshipper' of Yahweh), one of the 12 minor prophets. Nothing is known of him, and his book, the shortest of the prophetic writings, is at the same time one of the most difficult and interesting. Its 21 verses are directed against Edom and her behaviour to Judah when Jerusalem was captured and lots cast over it. The book shows parallels with Jeremiah too close to be due to coincidence. See G. W. Wade, *Micah, Obadiah, Joel, and Jonah*, 1925, and G. A. Smith, *The Book of the Twelve Prophets*, 1928.

**Oban**, burgh and seaport of Argyll, Scotland, 30 m. NW. of Inveraray. The little is. of Kerrera shelters the excellent harbour from the Atlantic gales. The tn's picturesque situation at the foot of the hills and the proximity of Glencoe, the is. of Staffa and Iona, and the ruins of Dunolly and Dunstaffnage castles, have made it a favourite tourist centre. Prin. manufs. are whisky and tweed, and fishing is carried on. Pop. 6500.

**Obbligato** (It. = obligatory), instrumental part in a musical composition, performing an important soloistic function, usually in an accompaniment to a vocal solo. In Bach's Mass in B minor, for instance, the bass aria *Quoniam* has a horn O.

**Obdorsk**, see SALEKHAARD.

**Obeah**, system of magic prevalent among the Negro pop. of the W. Indian colonies, especially in Jamaica, and also in the S. U.S.A. It appears to have been introduced from Africa by Negroes who had been enslaved, and to those O.-men (or women) people resorted for the cure of disorders, seeking revenge, the granting of favours, the discovery of a thief or adulterer, and the prediction of future events. O. offers power over events and

is thus essentially magical, giving to the poverty-stricken and often oppressed peasant a means for obtaining redress against a hostile world. Historically it is important as a rallying point for rebellion. O. cults providing foci against the frustrations of slavery and, to-day, poverty. It is found in conjunction with the cults called Pocomania and Myal (qq.v.). See H. J. Bell, *Obeah: Witchcraft in the West Indies*, 1889; R. T. Banbury, *Jamaica Superstitions or the Obeah Book*, 1895; J. J. Williams, *Voodoo and Obeah: Phases of West India Witchcraft*, 1933; F. Henriques, *Family and Colour in Jamaica*, 1953.

**Obeche** (*Triplochiton Scleroxylon*), large tree of tropical W. Africa. It produces a rather soft, light timber also called African whitewood because of its white colour. The timber has been used for coach-building, plywood manuif., shelving, and blackboards.

**Obeid**, El (Africa), see EL OBEID.

**Obelisk** (Gk *obeliskos*, diminutive of *obelos*, a spit), 4-sided monumental pillar with a pyramidal top derived from the *benben*, a squat O. representing a conical sand-hill, the seat of the sun god, the central cult object in the sun temple at Heliopolis. Always associated with sun worship, O.s were especially numerous at Heliopolis, but were later set up in pairs before temples as at Karnak, where 2 single O.s, one 109 ft high, still stand. The earliest O. still in position is a 12th-dynasty O. at Heliopolis (68 ft). Rom. emperors moved ser.: 12 are at Rome, 1 at Istanbul; 2 originally erected by Thothmes III at Heliopolis were taken by Augustus to Alexandria; one of these 'Cleopatra's Needles' was brought to London in 1877, and the other to New York in 1879. The O. in Paris, one of a pair of Rameses II which stood at Luxor, was presented by Mohammed Ali (1831). See R. Engelbach, *The Problem of the Obelisks*, 1923.

**Oberralp Pass**, in the Alps, on the borders of the cantons of Uri and Grisons, Switzerland. It attains a height of about 6730 ft, and connects Andermatt, above Göschenen, with the valley of the Vorder-Rhine to Disentis. With the Furka, it forms the chief route for tourists from the Simplon and Zermatt to the Engadine.

**Oberammergau**, Ger. Alpine vil. in the *Land of Bavaria* (q.v.), on the Ammer, 44 m. SW. by S. of Munich (q.v.). It is famous for its Passion Play (q.v.), which is performed every 10 years in fulfilment of a vow made by the inhab. in 1633 during a visitation of the plague. O. is a great wood-carving centre, and has a school to teach the craft. It has picturesque streets and brightly painted old houses. Pop. 5000.

**Oberelchingen**, see ELCHINGEN.

**Oberhausen**: 1. Ger. tn in the *Land of N. Rhine-Westphalia* (q.v.), near the Rhine and the Ruhr, 18 m. N. by E. of Düsseldorf (q.v.). It has important heavy industries, including the manuif. of iron, steel, machinery, ships, chemicals, and glass. The tn originated in 1846 as a halt on the Cologne-Minden railway, and

in 1862 its pop. was only 6000. Its outskirts are now practically a continuation of those of Duisburg (q.v.). Pop. 235,900.

2. Ger. tn in the *Land of Bavaria* (q.v.), a N. suburb of Augsburg (q.v.).

**Oberlin, Jean Frédéric** (1740-1826), Alsatian pastor and philanthropist, b. Strasburg, son of a teacher; studied theology, and became pastor of Waldbach in the Steintal valley (Ban de la Roche), a wild, mountainous dist. devastated in the Thirty Years War. Its poverty offered scope for O.'s philanthropy, and he became known for his efforts to benefit the people spiritually and materially by new roads and bridges, an improved agric. system, substantial cottages for the peasantry, an itinerant library, and a number of vil. schools; he was in fact the founder of the first infant schools. He helped the Brit. and Foreign Bible Society in its efforts to disseminate the Scriptures in continental countries. See lives by Spach, 1866, and E. Bodemann, 1868.

**Oberlin**, vil. of Ohio, U.S.A., 30 m. SW. by W. of Cleveland. O. College was founded here in 1833. Pop. 7100.

**Obermaier, Hugo** (1877-1946), Ger. archaeologist, b. Ratisbon. He entered the Church in 1900, and in 1911 became a prof. at the Institut de Paléontologie Humaine in Paris. In 1914 he became prof. at Madrid, and conducted valuable and highly regarded prehistoric research in Spain and elsewhere on the older Stone Age and palaeolithic art. From 1938 to 1946 he was prof. at Fribourg, Switzerland, where he had been driven after the civil war in Spain. His pubs. include *Der Mensch der Vorzeit*, 1912, *El hombre fosil*, 1920, 1944 (Eng. trans. 1921), *Buschmannskunstliche Felsmalereien aus Südwestafrika* (with H. Kühn), 1930, and *The Cave of Altamira at Santillana del Mar, Spain* (with H. Breuil), 1935.

**Oberon** (Fr. *Alberon*, or *Auberon*, and Ger. *Alberich*, 'rich elf'), king of the elves. In England he is best known for the delightful part he plays with Titania, his wife, in Shakespeare's *A Midsummer Night's Dream*. There is really no resemblance between this haughty little fairy and the ugly dwarf, Alberich, who steals the Rhine treasure in Wagner's *Ring*. O. is first called the 'roi du royaume de la féerie' in the 13th-cent. metrical romance, *Huon de Bordeaux*. His name is the title of a masque of Ben Jonson, 1616, an epic of Wieland, 1780, and an opera of Weber, 1826.

**Oberon**, outermost of the 5 satellites of Uranus (q.v.), discovered by Herschel in 1787. Mean distance 364,000 m. from the planet, periodic time 13 days 11 hrs, stellar magnitude 13.8.

**Oberösterreich**, see AUSTRIA, UPPER.

**Obesity**, abnormal excess of body fat. A certain accumulation of fat is normal, the main storage places being the subcutaneous tissues, the muscles, and in the abdomen. In states of undernourishment or in conditions in which the basal metabolic rate is increased the reserves of fat may be called upon to supply the

caloric requirements. O. usually results from a consumption of food, particularly fat and carbohydrates, which is excessive to normal requirements—requirements which vary from individual to individual. An active person requires more calories than one who is sedentary. In other cases the amount of O. seems to bear no direct relation to the amount of food intake. The endocrine glands play a part in the control of body weight. Thus there is a tendency to O. after middle age when endocrine function becomes less active. Inactivity of the thyroid and pituitary glands cause O.

**Obi Group**, see MOLLUSCAS.

**Obiter Dictum** (Lat. 'said by the way'), expression used specially to denote those judicial utterances and decisions in the course of delivering a judgment which, taken by themselves, were not strictly necessary for the decision of the particular issues raised. In the language of jurisprudence an O. D. is of 'persuasive' and not 'authoritative' efficacy, when cited by counsel in support of an argument. Maine (*Ancient Law*) states that the anct Roin. jurisconsults, in the days when they were called upon to give *responses* or legal decisions on cases submitted to them, were in no way bound by the special facts of the case, but could multiply the data at pleasure, and so evolve a general rule from facts, both real and hypothetical. In other words, the formulation of legal principles of wide application was of greater importance than the mere settlement of the suitor's difficulties. But in the Eng. courts of to-day one of the most effective reasons that can be urged by counsel to prevail upon the bench to ignore a proposition contained in the law reports, is to show that it was not necessary or relevant to the decision of the matter in hand.

**Object**, see SUBJECT AND SUBJECTIVE.

**Oblast**, territorial administrative unit in the U.S.S.R., corresponding to a prov.

**Oblates**, in the Rom. Catholic Church, congregations of men and women, not professed monks or nuns, dedicated to the service of religion. The best-known congregation is that founded by St Charles Borromeo, Archbishop of Milan, in 1578, and now known as the O. of St Charles. They form a community of priests who put themselves in the hands of the bishop to be used where and how he wishes. The title O. is also given to lay persons who follow a rule of life under the direction of a religious order, although living outside the monastery or convent.

**Obligation**, term used in jurisprudence (q.v.) to denote the binding force of a legal contract (q.v.). With the Rom. lawyers an O. could have its source in delict (tort or actionable wrong), as well as in contract. The Rom. maxim, 'A nude pact gives rise to no obligation, but might be the basis of an exception,' meant that there were some agreements not falling under the recognised heads of contract, which were not enforceable, but were available as defences. Some nude pacts were, however, actionable, e.g. the *pactum constitutae pecuniae*, or agreement to pay

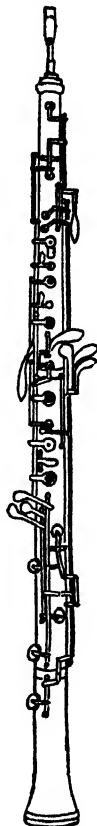
what one already owed. 'Natural O.s' were those which, devoid of a recognised legal force, had at least some moral claim to recognition, e.g. an agreement between a paterfamilias and anyone in his power, like a son or slave.

**Obligation, Days (or Holidays) of**, in the Rom. Catholic Church, days on which abstinence from servile labour and attendance at mass are commanded. These comprise all Sundays and (for England and Wales) the Circumcision, Epiphany, Ascension, Corpus Christi, SS. Peter and Paul, Assumption, All Saints, and Christmas Day. For Scotland, St Joseph and the Immaculate Conception must be added, and for Ireland the feasts of St Patrick and the Immaculate Conception.

**Oboek, or Obok**, Fr. colony of E. Africa, on the Gulf of Aden, now called Fr. Somaliland (q.v.). The port of O. was acquired for France in 1862, but it was not till 1884 that it was actively occupied. It has been superseded by Djibuti.

**Oboe** (formerly *Hautboy*; Fr. *hautbois*), woodwind instrument with a double-reed mouthpiece and a conical bore. It is made of rosewood or boxwood, and has 15 keys, exclusive of 2 octave keys which assist the production of the higher notes. The normal compass is from B $\flat$  below the staff to about F' in alt, and includes all the semitones; the music is written in the G clef and the O. is non-transposing. The O. has great technical efficiency and rich, if somewhat penetrating and varied tones. It descended from the shawm, and was in full use by the 16th cent., though it remained primitive until the 18th cent., and was not fully perfected until the 19th cent. Two O.s, together with 2 horns, were the most constant instruments in the orchestra, apart from the strings, in the 18th cent. Bach was fond of both the *oboe d'amore* and the *oboe da caccia*, now obsolete. There is an 8-ft reed organ stop sometimes called the hautboy, and reproducing the tone of the O.

**Obolus, or Obol** (Gk *obolos*), smallest anct Gk coin, and the smallest Gk weight in common use. As a coin it was always equivalent to one-sixth part of a drachma, and was therefore worth about 1.625d., though the amount varied. As a weight it was again equal to one-sixth of a drachma, that is, to about 16 grains, although it fell to as low as 8.6 grains during the later Rom. empire.



OBOE

**Obrecht, Jacob** (c. 1452–1505), Netherlands composer, b. Berg-op-Zoom, studied at Louvain Univ. and became a priest in his home tn in 1480, but from 1484 held musical posts—that year at Cambrai from 1485 at Bruges, and 1491–6 at Antwerp. Seriously ill, he went back to Berg-op-Zoom, but returned to Bruges in 1498. He was obliged to resign in 1500, and after another spell at Antwerp in 1501–2 went to Italy for his health. He had already spent 6 months at the ducal court of Ferrara in 1487–8 and he returned there in 1504, only to die of the plague in 1505. His works are masses, motets, and *chansons*; a Passion according to St Matthew may be by him.

**Obregón, Alvaro** (1880–1928), president of Mexico; b. in Sonora of mixed Basque and Yaqui stock, worked as carpenter and farmer. After Madero was shot, O. joined Carranza against Huerta, 1913, defeated that president, and became minister of war; he defeated Villa in 1915. After Carranza's murder O. was president four years from 1 Nov. 1920, and was succeeded by his nominee Calles, 1924–8. Calles procured O.'s re-election, 1 July 1928; but O. was assassinated sixteen days later. *See also* MEXICO, *History*.

**Obrenović, Serbian dynasty** founded by Miloš O. (q.v.), which held power in Serbia from 1815 to 1903, except the years 1842 to 1858.

**O'Brien, Kate** (1898– ), novelist and playwright, b. Limerick. Educ. at Univ. College, Dublin, she worked as a journalist in London. Her first novel, *Without My Cloak*, 1931, was awarded the Hawthornden and the Tait Black Memorial prizes. *The Ant-Room*, 1934, and *The Last of Summer*, 1943, contain shrewd pictures of the Irish temperament, with a background in co. Clare, while *The Land of Spices*, 1941, is an unusual and imaginative story somewhat marred by obscurity in the use of words. Other novels are *Mary Lavelle*, 1936, *Pray for the Wanderer*, 1938, and *That Lady*, 1946. Among her plays are *The Bridge*, 1927, and *The Schoolroom Window*, 1937. *Farewell Spain*, 1937, is a travel book.

**O'Brien, William** (1852–1928), Irish journalist and patriot, leader of the 'All for Ireland' party, b. Mallow, co. Cork. He estab. *United Ireland* in 1880, and ed. it with a view to popularising the aims of Parnell (q.v.) and the Land League (q.v.). He represented S. Tyrone, 1885–6; N.E. Cork, 1887–92; Cork City and N.E. Cork 1892. O.B. suffered continual imprisonments under the Crimes Act, in connection with the National League and Tenants' Defence League, 1887–91. At first an eager supporter of Parnell, he later veered round to the opposite side; but after he had sat on the Land Commission of 1903 he threw the whole weight of his influence into the scale of the conciliation policy, which looked towards the union of Irishmen of all creeds and classes. He represented Cork City again, 1910–18. At the election of 1918, he and his friends stood aside in favour of Sinn Féin (q.v.). Among his later books were *Evening*

*Memories*, 1920, and *The Irish Revolution and How it Came About*, 1923.

**O'Brien, William Smith** (1803–64), Irish patriot, b. Dromoland, co. Clare. He sat in Parliament, and, although a Protestant, favoured Catholic emancipation (q.v.). He joined the Repeal Association of Daniel O'Connell (q.v.), but in 1846 seceded to the Young Ireland (q.v.) party. In 1848 he led an abortive rising in Tipperary. He was captured and sentenced to death, but the sentence was commuted to one of transportation. In 1854 he regained his liberty.

**O'Bruadair (Broder), David** (fl. 1650–1694), poet, b. Limerick. He was a Jacobite and violent enemy of Protestantism and everything English. He was well versed in Irish hist. and literature, and the literary merit of his work as the bard of the Williamite wars is high. Nearly all of his 20 extant poems, which are written correctly in the difficult Irish metre (*Dan dírech*), reflect contemporary events. One of them, for example, is a 26-stanza political poem on Ireland's ills from 1641 to 1684; another is in praise of James II and dispraise of William of Orange, being dated 1688; another is on the exile of the native gentry after the siege of Limerick; and another, perhaps the most popular of all, is one whose first line trans. means 'O trooper, if thy desire be to rouse out from home.' Some of the poems were printed and trans. in the *Catalogue of Irish Manuscripts*, by Standish Hayes O'Grady (Brit. Museum). O.'s work was pub. in 3 vols. by MacErlcan, in 1910–17.

**Obscene Publications.** The common law and statutory misdemeanour of publishing obscene matter is known to lawyers as obscene libel. The essence of the offence is not that the pub. complained of is a libel but that it contains obscene matter. The test of obscenity has been defined by Chief Justice Cockburn as the tendency of the matter charged as obscenity to deprave and corrupt those whose minds are open to such immoral influence and into whose hands a pub. of this sort may fall. A book may shock or disgust readers without necessarily being an obscene libel. Although the prin. object of prosecutions is to prevent the corruption of the morals of the young, Mr Justice Stabile in *Regina v. Secker & Warburg*, 1954, rejected the notion that literary standards should be of a level suitable for a 14-year-old schoolgirl. He added that many works of great literature are wholly unsuitable for reading by adolescents, but that did not mean that the publisher is guilty of a criminal offence in making them available to the general public. There is some doubt whether obscenity must depend on the dominant effect of the whole book or on the corrupting influence of selected passages. It has, however, been held that, notwithstanding the innocuous contents of a book, its dust jacket may taint the whole book with obscenity. The authors, publishers, printers, and distributors of obscene libels are liable to prosecutions, which may be brought by members of the

public; in practice, such prosecutions are usually by the police after consultation with the Director of Public Prosecutions. The jury must ignore the literary or artistic merit of an alleged obscene libel and confine itself to the question whether the work is likely to corrupt or deprave. It is not allowed to hear expert literary evidence and authors, as the motive of the author is irrelevant. Despite the sensible direction given by Mr Justice Stable to the jury in the Secker & Warburg case, which resulted in the defendants' acquittal, no author or publisher, however respectable, can ever be certain what magistrates or jurors may regard as obscene. As recently as 1954 the Swindon magistrates condemned the *Decameron* as obscene.

The Obscene Publications Act, 1957, empowers magistrates to order the destruction of books which they regard as obscene. They may issue a warrant authorising the police to enter premises believed to contain any obscene matter for sale and to seize any such matter found there. The occupier of the premises, usually a bookseller, is then summoned before the magistrates to show cause why the seized matter should not be destroyed. Booksellers often take the line of least resistance as neither the author nor the publisher may give or call evidence. The magistrates have complete discretion in reaching their decision and, even if the prosecution offers no evidence as to obscenity, may make a destruction order. If the defendant does not appeal within 7 days the destruction order is then executed. There are several other statutes dealing with O. P. The Vagrancy Acts, 1824 and 1838, make it an offence to hold indecent exhibitions. Advertisements dealing with venereal diseases unless sanctioned by local authorities or the Ministry of Health come within the Acts prohibiting the exhibition of indecent writings or prints. The Customs Acts, 1876 and 1952, prohibit the importation of obscene matter and render the importer liable to maximum penalties of a £100 fine and 5 years' imprisonment and to seizure and destruction of such matter. If the owner is not the importer, the customs authorities must notify him in writing that they have impounded the offending matter. Should he make a written claim for his property, it must be taken before the courts for a finding of obscenity or returned to him. The Post Office Act, 1953, prescribes penalties for sending indecent matter through the post or indecent messages by telephone or telegram. The Judicial Proceedings (Regulation of Reports) Act, 1926, prohibits the pub. of indecent matter in reports of any court proceedings and limits the details which may be included in reports of matrimonial cases.

The Society of Authors and other bodies have for some time been demanding that the law of obscene libel should be reformed. Lord Lambton on 21 Nov. 1956 introduced an Obscene Publications Bill which he later withdrew on an undertaking from the Gov. to refer the matter to a Select Committee. The Bill provided

a wider and more up-to-date definition of obscenity. A pub. would be deemed to be obscene (a) if its dominant effect was reasonably likely to deprave and corrupt persons to whom it was intended to be distributed, circulated, or offered for sale, or (b) if, whether or not related to any sexual context, it unduly exploited horror, cruelty, or violence.

Authors and publishers would be permitted to call expert evidence as to the literary or artistic merit or medical, scientific, legal, or political character or importance of allegedly O. P.s. Maximum penalties would be prescribed; at present there are no limits. Obscene libel would cease to be punishable at common law. Customs authorities who seized imported matter considered obscene would be obliged to apply within a reasonable time for a destruction order or return it to its owner. In any proceedings for a destruction order, authors, publishers, and printers would have the right to be heard on the question whether the offending matter was obscene. The foregoing proposals were strongly supported by many witnesses who gave evidence to the Select Committee which was appointed in 1957. Although opinions on detailed charges in the law may differ, the general trend of the evidence evinced a strong desire to protect genuine literary merit from squeamish censorship, but to punish the pornographer. See N. St John-Stevas, *Obscenity and the Law*, 1956.

**Obscurantists** (Lat. *obscurare*), term applied at the time of the revival of learning to those who were opposed to all new views, irrespective of their origin, by reason of religious prejudice. The word 'obscurantism' is derived from the pub. in Germany in 1516-17 of *Epistolae obscurorum virorum* (q.v.) against some monks of Cologne. It is still applied sometimes to opponents of progressive ideas.

**Observants**, see FRANCISCANS.

**Observation**, mental act whereby the intellect becomes aware of sense data, existents, and universals. Awareness may be defined as a direct cognitive relation with an object. Sensory O. is limited to the direct acquaintance with sense data. When we see a colour or hear a sound our direct cognitive relation is with that colour or sound as such. It is only by a further mental act that we become aware of the objects which causes the sense data of colour and sound. This act is known as perception. Perceptive O., of which sense data are a *sine qua non*, is that form of awareness which we have of particular existent objects. Thus when we see the moon sensory O. makes us aware of light over a defined surface; it is by perception that we have a direct cognitive relation with the luminous object which by convention we call the moon. Further, in the act of introspection we are often aware not only of certain objects, but also of those objects in various cognitive and conative relations with ourselves. We may perceive not only the moon, but also ourselves as perceiving agents; we may desire the satisfaction of



some appetite and at the same time perceive ourselves as desiring. Awareness, however, is not limited to sense data and existent particulars. It extends also to universals, and to universal relations. We are aware not only of red objects, but also of redness; not only of an object preceding another, but also of before and after. Nevertheless, awareness of these universals does not of itself prove the existence of an object partaking of such universals. *See also* EPISTEMOLOGY.

**Observation, Errors of,** *see* ERRORS.

**Observatory,** institution for the scientific observation, by means of highly specialised instruments, of natural phenomena, the conditions of which cannot be controlled by the scientist. O.s are classed as astronomical, magnetic, meteorological, tidal, and seismic and volcanic. Astronomical O.s date from very early times if we include obelisks, pyramids, temples, and stone circles, all of which had undoubtedly astronomical uses. The Chinese Emperor Huang-Ti (2698-2598 BC) is said to have been responsible for the erection of a great O., but as it is now generally accepted that Chinese emperors prior to about 800 BC are legendary, this statement should not be taken seriously. The O. at Alexandria, founded in the 3rd cent. BC, and associated with the names of Hipparchus, who carried out his observations between 161 and 126 BC, and of Ptolemy, who lived at Alexandria about the middle of the 2nd cent. AD, is usually considered the first, and continued until nearly the end of the 2nd cent. During the Middle Ages a number of O.s were founded in Muslim lands, amongst which may be noticed those at Damascus, Bagdad, Meragha, and Samarkand. The first European O. was that erected at Nuremberg in 1427 by Bernhard Walther, a wealthy citizen, who had the co-operation of John Müller, known as Regiomontanus, a very capable astronomer. In 1561 Kassel O. was founded by William IV, landgrave of Hesse, and later Hven in the Sound, where the Dane, Tycho Brahe, inaugurated observational methods (1576-97) which proved invaluable to astronomers of later years. The first post-Galilean O. was that connected with the univ. of Leyden (1632), and the needs of the art of navigation gave rise to the Paris O., completed in 1671, and to the Greenwich O., completed 5 years later; during this cent. Helvelius worked at his own private O. at Danzig, measuring stellar altitudes and making careful drawings of the moon. The Greenwich O. commenced magnetic and meteorological work in 1838 and special solar photography in 1873. It is a Royal O. presided over by an Astronomer Royal, as also is the O. at Blackford Hill, Edinburgh, founded in 1818 at Calton Hill and moved to its present site in 1896. Herstmonceux Castle, Sussex, was chosen in 1946 as the home of the Royal O., Greenwich. Owing to the growth of London, astronomical observations at Greenwich were restricted by the impurity of the atmosphere and the glare of the sky at night; for this reason the

removal of the O. from the London area became necessary for satisfactory observations. Normal work is now in progress at Herstmonceux. *See* RADIO-ASTRONOMY.

Other institutions in Great Britain include Univ. O., Durham; Univ. O., Oxford (1875); Univ. O. and Solar Physics O., Cambridge, the former founded in 1820 and the latter removed from S. Kensington in 1913, both now under one director; Univ. of London O., Mill Hill; Imperial College O., S. Kensington; Norman Lockyer O., Sidmouth; Univ. O., Glasgow (1840); St. Andrew's O.; Liverpool O. (tidal); besides many private O.s. In N. Ireland there is the Armagh O. (1791), and in Eire Dunsink O. (1785), now part of the Dublin Institute for Advanced Studies and supported by the gov. of the rep. In S. Africa are the Royal O., Cape of Good Hope; Radcliffe O., Pretoria; Union O., Johannesburg, and the Yale O. branch station; Bloemfontein O., branch of Harvard College O., and also the Lamont-Hussey O., a branch of the O. of the univ. of Michigan. In Australia, New Zealand, and Canada there are O.s at Canberra, Sydney, Perth, Wellington, Ottawa, Victoria, Toronto (2), and Quebec.

France has O.s at Paris, Meudon, Marseilles, Nice, and Pic du Midi (a branch of Toulouse Univ. O.); Germany at Bonn, Gotha, Göttingen, Leipzig, Munich, Potsdam (2), Bergerdorf, Heidelberg, and Berlin; Italy at Rome and also in the Vatican city, Milan, Naples, Pola, and Sicily at Catania and Palermo; Spain at Madrid and Barcelona; Portugal at Lisbon; Switzerland at Geneva and Zürich; Hungary at Budapest and Kalocsa; Czechoslovakia at Prague; Austria at Vienna and Kremsmünster; Holland at Leyden; Belgium at Brussels; Denmark at Copenhagen; Norway at Oslo; Sweden at Lund; Poland at Cracow and Warsaw; Latvia at Riga; Estonia at Tartu (formerly Dorpat); Finland at Helsingfors; Russia at Leningrad, Pulkovo, Odessa, Moscow, Ivov (2), and Nikolaev; Greece at Athens; Turkey at Istanbul.

America has a very large number of O.s and only a few can be noticed, amongst which are Yerkes O. at Williams Bay; Mt. Wilson O.s (2; 550 ft and 5715 ft); Lick O. at Mt. Hamilton (4210 ft); Flagstaff O. (the famous Lowell O.) in Arizona; Harvard Univ. O.; Leander McCormick O., Virginia; Naval O. at Washington; Delaware O., Ohio; Ann Arbor O., Michigan; Berkeley O., California. The 200-in. telescope is now working at Mt. Palomar, California, and great results have been obtained from it. In Mexico there is the National O. at Tacubaya and in S. America there are O.s at Caracas, Córdoba, La Plata, Quito, Rio de Janeiro, Santiago, and Montevideo. In other parts of the world there are a few more O.s, amongst which may be noticed those at Helwan, Tashkent, Hyderabad, Madras, Kodakanal, Bombay, Kunming, Tsingtao, Hong Kong, Kami-Tamakami, Kyoto, and Tokyo.

The modern tendency in astronomy has been specialisation, but combined international work, especially on star cataloguing, is carried on. The Royal O., Edinburgh, does a considerable amount of work on spectrophotometry; Oxford Univ. O. specialises on solar work; Liverpool O. and Tidal Institute is concerned solely with tides; Imperial College O., S. Kensington, is used mainly for teaching students and carries out laboratory investigation of molecular spectra; Heidelberg, Potsdam, and many other O.s concentrate on astrophysics; the Dominion O., Ottawa, has recently devoted a lot of time to meteor investigation with the use of radar. The Univ. of Manchester at Jodrell Bank (q.v.) Experimental Station has already played a prominent part in charting the artificial satellites; the Lowell O. was specially built for planetary work, in particular on Mars.

Many large O.s have been estab. in comparatively recent times, and special developments have taken place in equatorial mountings. The tower telescope is a feature in these; this telescope does not move, but the light from the sun is fed into it by a coelostat. This is a mirror mounted in such a way that it turns on an axis parallel to the earth's axis, and at such a rate that it just counteracts the earth's rotation. The light is reflected on another fixed mirror, which then sends it downward to an object glass which forms an image in the laboratory at the base of the tower. Under the laboratory is a well from which the sunlight, directed upon a grating, is returned to the laboratory dispersed into spectra, where it can be examined. One tower at Mt Wilson O. is 150 ft high and a smaller one is 60 ft high. The Astrophysical O. at Arcetri (Florence) has a tower 80 ft high and the Einstein tower of the Astrophysical O., Potsdam, is 50 ft high. This tower was erected in 1921 and was named after the famous scientist. See also TELESCOPE.

**Magnetic observatories.** The chief Brit. magnetic O. was the magnetic dept of the Royal O., Greenwich, but this has been moved to Abinger. Two other magnetic O.s (under the control of the Air Ministry) have been estab.: at Lerwick, Shetland Is., and Eskdalemuir, Dumfries. There is an Admiralty Compass O. at Slough, but the work there is mainly connected with the gyro-compass, not with the magnetic compass. The naval O.s in various countries devote particular attention to magnetic work, and important investigations on the subject have been made by polar explorers who have determined the magnetic N. and S. poles, but not always with great accuracy in the case of the N. magnetic pole. Aerial observations in recent times have given the position of the N. magnetic pole with much greater accuracy than that obtained by previous investigators.

Meteorological O.s are referred to in the article METEOROLOGY, and seismological O.s in the article SEISMOGRAPH AND SEISMOLOGY.

The *Nautical Almanac* once pub. a list of O.s each year; this ceased in 1941, but

the list has been continued in the 1955 and subsequent issues. The *American Ephemeris and Nautical Almanac* publishes a list every year.

**'Observer,'** oldest Eng. Sunday newspaper, founded in Dec. 1791 on a capital of £100 by a young Irishman, W. S. Bourne, whose elder brother, W. H. Bourne, managed the new paper's finances. By 1799 they had estab. the O. as the first successful Sunday paper, with a circulation in London and the provs. and a guaranteed delivery to Dublin as the weather permitted. Early in the 19th cent. the O. was acquired by W. I. Clement, a pioneer in the field of pictorial journalism and the first man to establish a newspaper syndicate. In 1870 it was bought by Julius Beer, a wealthy friend of Gladstone, and with his son he conducted the paper with such distinction that it achieved much of the status and quality for which it is known to-day. In 1905 the O. was bought by Lord Northcliffe, who appointed J. L. Garvin as editor; Garvin made the paper the foremost Sunday jour. in England and gained for it international prestige. The first Lord Astor acquired the O. in 1911; in 1945 the second Lord Astor, and his son the Hon. David Astor, vested the ownership of the paper in a trust. The present sale is about 600,000 copies.

**Observer Corps, Royal,** uniformed civilian organisation under the operational control of R.A.F. Fighter Command which reports movements of aircraft and also gives aid by reporting the positions of aircraft in distress or which have crashed. H.Q. are at Bentley Priory, Stanmore, Middx. The corps was stood down on 12 May 1945, at the end of the war, but was reconstituted on 1 Jan. 1947, on a spare-time basis. In the Second World War its membership was 32,000, including 6000 women, and it had a network of 1420 posts reporting to 40 operations rooms. Up to April 1941, when the title Royal was conferred upon it in recognition of its work in the battle of Britain, the corps was known as the Observer Corps. It was constituted as such in 1925, the members being special constables. In 1927 operational control passed from the War Office to the Air Ministry and in Aug. 1939 the Air Ministry also took over administration from the Home Office. To-day the R. O. C. forms a vital part of the first-line early-warning defence system of R.A.F. Fighter Command, and is also responsible for reporting radioactive fall-out for the information of the services and civil defence forces in time of war.

**Obsessional Psychoneuroses** are characterised by a continuous preoccupation with some apparently unimportant idea or group of ideas, to the comparative exclusion of most other interests and to the distress of the patient. They may be divided into (1) obsessive ruminative states and (2) obsessive compulsive states. Clinically these are distinguishable by the fact that in the latter the preoccupation manifests itself as a compulsion to some form of activity, which is always symbolic,

although frequently illogical or purposeless. Obsessional reactions tend to occur in the intellectual, critical, over-conscientious, and rather introverted type of personality. It is said that it would be difficult to develop an obsessional psychoneurosis without a relevant constitutional predisposition. The mechanism in the production of the obsessional psychoneurosis may be explained as follows. There exists in the patient's mind an idea or a wish, which is of such a nature that it is repugnant and intolerable to the super-ego, and whose relevant effect is therefore one of guilt or reproach. The ego endeavours to prevent such an idea from entering consciousness by substituting for it either another idea, which is indifferent in itself, or (in the compulsive variety) an act. The genesis of the condition is therefore a conflict between a wish and a fear. This subterfuge does not, however, enable the patient to get rid of the affect, which now attaches itself to the substitute idea or act, and thereby maintains the latter in consciousness, and accounts for its 'compulsive' quality. The treatment of the milder forms of obsessive rumination and compulsion is the same as the treatment of anxiety states in general. In the severe types of illness treatment is a much more difficult matter and usually some form of analytical psychotherapy is called for. See also PSYCHONEUROSIS.

**Obsidian**, dark-coloured vitreous lava or volcanic rock, of varying composition, resembling common bottle-glass. It is generally black, but may be brown, red, or grey, or a combination of these colours. All *O.s* have a low sp. gr. because they are acid rocks and non-crystalline, and their lustre is vitreous. When broken, *O.* shows a conchoidal fracture similar to that of glass, and yields sharp-edged fragments largely employed by primitive races for spear-heads, knives, arrow-points, etc. *O.* occurs in the Lipari Is., Iceland, Hungary, Mexico, the Yellowstone Park, New Zealand, Ascension, and the Caucasus. *O.* was worked as a gem-stone by the ancients and Romans, the prin. source of the stone for the whole Aegean area being the is. of Melos. At the present time it is sometimes cut and polished as an ornamental stone.

**Obsolete Weights and Measures**, see METROLOGY.

**Obstetrics** (Lat. *obstetriz*, midwife; from *obstare*, to stand before), that part of medicine which deals with pregnancy, childbirth, and the puerperium. Midwives are mentioned in the Bible, and birth stools or obstetric chairs were in use (Exod. i. 15-20). Until early in the 18th cent. the practice of *O.* remained almost entirely in the hands of midwives. The great Wm Harvey (q.v.) practised *O.* and had written on the subject in 1651, and Peter Chamberlen (the elder, 1560-1631, q.v.), a Huguenot refugee and one of the second of 4 generations of medical Chamberlens, had invented his obstetric forceps, the secret of which remained closely guarded until the last of the Chamberlens, Hugh, d. in 1728. But it was not until Richard

Manningham, who instituted lying-in wards in 1739, Sir Fielding Ould, who helped to found in 1710 the Dublin School of Midwifery, and Wm Giffard (1726), and Edmund Chapman (1733) began to specialize in the subject that so-called 'man-midwives' estab. an ascendancy in the practice of *O.* Perhaps the real founder of Brit. midwifery was Wm Smellie (1697-1763) (q.v.), a Scot who settled in London in 1739. During his 10 years there, 900 students attended his classes, and with them he attended 1150 labours. Smellie was one of the first to use the 'new' forceps, but such was the prejudice of midwives and patients against them that he used them seldom. Wm Hunter (q.v.) joined Smellie in London, and when the latter returned to his native country Hunter became the leading obstetrician. It was another 100 years before the next notable event in the hist. of *O.* James Young Simpson (1811-1870) (q.v.), an Edinburgh obstetrician, brought chloroform into use in childbirth. He was strongly attacked, even by some of his colleagues, not on medical but on moral grounds, it being said that chloroform would 'rob God of the deep earnest cries' of women in labour. Queen Victoria did much in a practical way to settle this controversy by allowing Dr John Snow (q.v.) to administer the anaesthetic to her for 2 of her confinements. The chief monument to-day of Sir J. Y. Simpson is the Simpson Maternity Hospital, Edinburgh. At the same time that Simpson was introducing chloroform, Ignaz Philipp Semmelweis (1818-65) (q.v.) was putting forward, in Vienna, his theory on puerperal fever. Obstetricians had long been familiar with this septic infection in the lying-in room and although no proper statistics were kept, it was, however, estimated that from 10 to 20 per cent of women contracted the infection, and that 30 per cent of those who contracted it died of it. Alexander Gordon in Aberdeen in 1795 had declared his opinion, based on observation, that puerperal infection was transmitted by doctors and midwives, but he could not explain how, and his forthright views made him so unpopular that he found it expedient to leave the city and join the navy. Twenty years later Gordon's ideas received strong support in America from Oliver Wendell Holmes, and in 1843 Holmes pub. his findings in a classic paper 'On the Contagiousness of Puerperal Fever.' Knowledge of microbic agents being lacking at that time, Holmes had no idea how the infection was being conveyed, but, like Gordon before him, he was convinced it was by human agency. He urged that any doctor who had attended one case of puerperal fever should not attend another until he had 'purified' himself. As in the case of Gordon, Holmes's views were also received with scepticism. This, then, was the background to Semmelweis's approach to the subject. He was on the staff of the largest maternity clinic in the world at the time, and this clinic, in Vienna, was built in 2 separate divs. In one the cases were

conducted by male obstetricians who taught students, and in the other female midwives delivered the cases. Semmelweis noticed that in the male div. there was at least 3 times more puerperal infection than in the female div. He came to the conclusion that the discrepancy was due to the fact that the male obstetricians and the students were in the habit of attending post-mortem examinations, and sometimes assisting in them, and then going straight to the lying-in wards to attend women in labour. Moreover they did not always wash their hands. Semmelweis, of course, did not know of bacteria any more than did Gordon or Holmes. He postulated the theory of 'cadaveric particles' and 'decomposed animal organic matter,' and he persuaded his fellow obstetricians at least to wash their hands in antiseptic before attending obstetric cases. This simple measure brought down the case mortality in the male div. to the same as that in the female div. Semmelweis, however, became unpopular with his colleagues, who never really accepted his views, and it remained for Pasteur (q.v.) in 1879, 14 years after Semmelweis's death, to give proof to what previously had been only supposition based on clinical observation. Pasteur identified the causative streptococcus from the blood of women with puerperal fever. A few years later Koch (q.v.) was able to grow the streptococcus on culture medium. From then on the story of puerperal fever became that of the investigation of the epidemiology of the disease—what was the source of the infection, how was it transmitted, and how did it enter the patient's system? The answer to all these questions was provided by the brilliant and patient work of many bacteriologists, and, from the answers, a policy aimed at preventing infection was formulated. Midwifery began to be practised with the same rigorous attention to asepsis as was followed in surgical operations. Accoucheurs wore masks, instruments, towels, and gowns were sterilised, and the wearing of sterile rubber gloves became *de rigueur*. This was the policy that was pursued between 1928 and 1935. It had results but not to the extent that had been hoped for, and the outlook for curing, as opposed to preventing, the disease seemed as remote as ever. Then came the discovery by G. Domagk in Germany of the red dye 'prontosil' and from this the development of sulphanilimide, the first of the 'sulpha drugs.' Their lethal action on the streptococcus of puerperal infection was dramatic, and the cure for this dread disease, which from 1880 to 1930 had killed 2000 mothers in England and Wales every year, was found. The antibiotics followed soon after, and by 1950 the number of deaths had fallen to 85, of which 64 had followed abortion.

Great though it was, the victory over puerperal fever was not by any means the only advance that was made in the field of O. Although the Medical Act of 1856 had included midwifery as one of the subjects in which it was necessary for a doctor to

qualify in order to obtain registration with the General Medical Council, it was not until the beginning of the present cent. that O. began to be regarded as a branch of medicine in its own right. Previously the obstetrician's duties were regarded to be that merely of a dexterous manipulator. He seldom saw his patient until labour began, and in the lying-in room he was assisted by uneduc. and untrained women of the 'Gamp' type. The perpetuation of this state of affairs was fostered by Victorian prudery, which largely stifled any attempts at rational public discussion of what was regarded as an indelicate subject, but it was one which, nevertheless, vitally affected the health and welfare of the nation. Fortunately a few determined women, led by Miss Louisa Hubbard, banded together in 1881 and founded the Midwives Institute with a view to 'raising the efficiency and improving the status of midwifery' so that the mothers and babies of this country could get the better care they so sorely needed. From this small beginning there grew the College of Midwives, to become the Royal College of Midwives in 1947, with a membership (in 1955) of some 10,000 trained professional women with the status of practitioners of normal midwifery in their own right and accepting responsibility for 80 per cent. of all the deliveries in this country. Miss Hubbard and her friends were not alone in their agitation for better conditions for midwifery. The Brit. Medical Association made 2 attempts to promote Bills to regulate the practice of midwifery, and at last, in 1902, the first Midwives Act reached the Statute Book. The Act set up a Central Midwives Board to keep a register of midwives, to make rules for the conduct of their work, and to set minimum standards of professional educational attainment. Thus it was that out of chaos was created a body of trained, registered, and supervised women. The present low maternal mortality rate, which stood in 1955 at just over one per 1000 live births compared with about six per 1000 at 1900, is largely attributable to the midwives' skill. In the medical field the beginning of the cent. saw the dawn of the idea of preventive medicine in midwifery, and the era of antenatal supervision was ushered in (*see under PREGNANCY*). The new doctrine was greatly expedited by the shock to the national conscience caused by the revelations of a deplorable standard of national physique in the First World War. It was realised that to improve this a start should be made at the beginning and that healthy babies must have healthy mothers. Antenatal clinics were estab. by local authorities in the early twenties, and nowadays every pregnant woman has antenatal care. At the same period a nation-wide campaign against rickets was started, with the result that the frequency of deformed and contracted pelvis has been diminished to-day almost to vanishing point. Medical teaching in O. greatly improved from the beginning of this cent. and the final emancipation of

this branch of medicine was in 1928, when the Brit. College of Obstetricians and Gynaecologists was formed. This infant grew to full stature in 1938, when King George VI granted it the right to call itself 'Royal.' The diplomas of the R.C.O.G. are now the recognised portal of entry to specialisation in gynaecology and O. Together with the growth of O. as a speciality came the tendency for the number of confinements taking place in hospitals to increase. Many of the facilities for the practice of modern O. could be properly available only in institutions, and popular demand and medical prudence both dictated the wisdom of admitting to hospital those in their first pregnancy and those in whom antenatal examination suggested the possibility of some complication arising. For normal cases and those who have had previous pregnancies, domiciliary confinement has much to commend it. There is less risk of infection, and the services of midwives and of general practitioner obstetricians are available without cost to the patient under the National Health Service. Also available are health visitors, domestic helps, and other adjuncts to the welfare state. The relief of pain in childbirth has travelled a long way since Simpson's day, and all midwives are now trained in the use of analgesics. Inhalation of nitrous oxide gas and air, for long the standard analgesic, is now being displaced by 'trilene,' which is efficient and safe. 'Twilight sleep,' induced by the administration of the drugs morphine and scopolamine and once in vogue, has now been abandoned in favour of more modern and less harmful drugs such as pethidine.

Antenatal care and the early detection of abnormalities, together with an ever improving standard of health and physique in young women, have led to a marked reduction in the number of cases of childbirth needing operative interference in delivery. At least 80 per cent of all births are by natural means. The stillbirth and neonatal mortality rate, due in large measure to birth injury, has been practically halved in this country since 1928. A much improved technique in caesarean section (q.v.) and safe anaesthesia has made this operation one of choice in all cases in which there might be undue hazard to mother and child if delivery were left to follow its natural course. The special complication of toxæmia of pregnancy is described in the article on pregnancy (q.v.). Haemorrhage, antepartum and postpartum, is a complication which is one of the emergencies of O. Thanks to modern methods of blood transfusion and the arrangements for the immediate availability of blood of the right group in all parts of the country, this one-time nightmare of O. has to a large extent lost its terrors. Most hospital centres have an obstetric 'flying squad' equipped with all facilities for dealing immediately with an emergency domiciliary case should the call come.

The discovery by Landsteiner and Wiener in 1940 of the rhesus factor in the blood increased our knowledge of an

important condition known as haemolytic disease of the newborn. About 5 babies in every 1000 births suffer from it, and of these there is a risk that between 10 per cent and 80 per cent will be still-born. Those that survive show anaemia and jaundice at birth or developing within 24 hrs. The latter must not be confused with an ordinary physiological jaundice, which often develops harmlessly after about the third day of life. The cause of haemolytic disease of the newborn may be explained in the following way. The blood of 85 per cent of persons in this country is rhesus-positive and 15 per cent are rhesus-negative. When rhesus-positive blood is transfused into the blood stream of a person who is rhesus-negative, the rhesus-negative person develops antibodies in their blood (in the same way as antibodies are developed after vaccines). If at any time more rhesus-positive blood is transfused into an already immunised rhesus-negative person (i.e. one who has developed antibodies against rhesus-positive blood) the antibodies 'attack' the transfused rhesus-positive blood, destroying the red cells and liberating haemoglobin. This is known as 'haemolysis.' The signs of this haemolysis are jaundice, anaemia, and, in severe cases, death. In haemolytic disease of the newborn the same thing occurs. If the blood of the foetus is rhesus-positive and that of its mother rhesus-negative, and some of the foetal blood leaks into the maternal circulation across the placental barrier (see PLACENTA) then rhesus antibodies develop in the maternal circulation. These antibodies then pass back into the foetal circulation and produce haemolysis. It is important, therefore, that all pregnant women's blood group should be determined early in the antenatal period so that if it is rhesus-negative plans may be made to treat the baby should it happen to suffer from haemolytic disease when born. If antibodies are absent from the mother's blood at the thirty-fourth week of pregnancy then it is likely that the baby will not be affected. The only effective treatment for severe haemolytic disease of the newborn is what is known as 'exchange blood transfusion.' The baby's haemolysed blood is drained from it and at the same time fresh, normal blood is transfused into it. In mild cases simple blood transfusion without exchange may suffice.

Puerperal fever has been referred to earlier in this article. Other milder infections such as breast abscess and thrombophlebitis may affect the mother during the puerperium. Infections of mother and baby by the staphylococcus may occur and epidemics of penicillin-resistant staphylococcal boils and abscesses are not uncommon in maternity hospitals. Seldom serious, they nevertheless present a constant challenge to aseptic technique and are a continual reminder that, despite the antibiotics, bacteria have a way of keeping an ace or two up their sleeves. Modern practice brings the paediatrician and the obstetrician together in the management of

the newborn baby, particularly in those suffering from shock and in need of resuscitation, and in estab. of lactation, breast-feeding being the special concern of the paediatrician. The latter also advises in cases of premature birth, and considerable advance has been made in the rearing of premature babies.

**Obuda**, see **BUDAPEST**.

**Obwalden**, see **UNTERWALDEN**.

**Ocarina**, musical toy wind instrument of metal or terracotta, in shape resembling a goose's (lt. oca) egg. It was introduced into England by travelling Ger. or Tyrolean musicians, and sounds somewhat like a flageolet. There are 10 finger-holes, a whistle-like mouthpiece, and a large internal cavity. The Chinese hsiian (c. 3000 bc) was perhaps its ant. prototype.

**O'Carolan**, Turlough, see **CAROLAN**.

**O'Casey**, Sean (1884- ), dramatist, b. Dublin. Reared in the Dublin tenements, which often serve as a setting for his plays, O'C. exploited the sheer comedy, coupled with intense tragedy, to be found by discerning eyes in those grim slum dwellings. He read omnivorously as a boy, and began to write in his early thirties. His Abbey Theatre career began in 1923. His *Junio and the Paycock*, produced in 1925, was a great success in London. It was followed by *The Plough and the Stars* in 1926. These plays estab. him as master of comedy and pathos on the grand scale, native in idiom and convincingly true. He was always an experimentalist and forsook the purely realistic theatre for fantasy, as shown in *The Silver Tassie*, 1928, and *Within the Gates*, 1933, both expressionist plays. 'Van Gogh,' he said, 'and particularly Cézanne, took from the extravagance of Cubism its possibilities and, uniting these with the greater possibilities of Realism and Impressionism, burst into a new art in painting. Now that is what I want to do in drama.' To those who relish propaganda on social and political problems these later plays were welcomed as masterpieces, but to others the excessive use of symbolic types in place of individual characters seemed to render them inferior as drama to his early works. O'C. has long been settled at Totnes. Other works include *The Shadow of the Gunman* (an early play), 1915, *Windfalls*, 1934, *Essays on the Theatre*, 1937, *Purple Dust*, 1940, *Oak Leaves and Lavender*, 1946, and *Collected Plays*, 1949. He also wrote a lengthy autobiography of which the separate parts are *I Knock at the Door*, 1939, *Pictures in the Hallway*, 1942, *Drums under the Window*, 1945, *Irishfallen Fare Thee Well*, 1949, *Rose and Crown*, 1952, and *Sunset and Evening Star*, 1954. See S. Gwynn, *Irish Literature and Drama*, 1936.

**Occam**, William of, see **OCKHAM**.

**Occasional Conformity**. The Test and Corporation Acts were designed to exclude non-Anglicans from certain public offices by making attendance at communion a condition of service. To evade this barrier many nonconformists adopted the practice of taking communion occasionally to satisfy the Acts. The Occasional Conformity Act of 1711 made this practice

illegal, but was repealed in 1718. An ann. indemnity Act, to permit nonconformists to hold office, was in operation from 1727 to 1829.

**Oocleve**, Thomas, see **HOCLEVE**.

**Occlusion**, absorption of a gas by a metal. Many solids are capable of occluding gases when in a molten state, and the gas so occluded is usually emitted on solidification. Certain metals, notably the platinum metals, have the property of absorbing gases without being fused, especially when the metal is in a finely divided state. Platinum black, for instance, takes up 100 times its volume of oxygen, and 110 times its volume of hydrogen; palladium absorbs over 600 times its volume of hydrogen; iron, cobalt, nickel, copper, silver, and gold exhibit the phenomenon of O. in a lower degree. The intimate contact of these gases when occluded leads to chemical combination, in which great heat is evolved. Thus a jet of hydrogen or coal-gas directed against platinum black causes the metal to glow, and the jet is speedily ignited. The large proportion of hydrogen occluded by palladium led to the supposition that a definite compound, palladium hydride, Pd<sub>2</sub>H, had been formed, and recent chemical opinion confirms this. There are also hydrides Pd<sub>3</sub>H and Pd<sub>4</sub>H, but their compositions are not yet certain and they are merely referred to as palladium hydrides.

**Occlusions**, Cold and Warm, see **METEOROLOGY**.

**Ocult Sciences**, see **MAGIC**; **NECROMANCY**; **WITCHCRAFT**.

**Ocultation** usually refers to the concealment of a star or planet by the moon. By its eastward motion the moon eclipses the body, which disappears behind the E. limb and reappears at the W. In the first half of the lunation, the E. limb being dark and the star a mere point, the O. is sudden, forming a most accurate means of determining the moon's position, and thus assisting in ascertaining certain inequalities of a very complicated nature in the moon's mean motion. When the Greenwich time is known the long. of a place can be found by noting the instant of O. but the comparative rarity of these phenomena renders this method of little practical use at sea. The phenomenon is confined to a belt about 10° 17½' wide in the heavens.

**Occupational Diseases**. There are few occupations entirely free from risk of disease. Even agric. and other workers are liable, in consequence of exposure to the weather and the sun's rays, to contract cancer of the skin (epithelioma). Writers, telegraphists, and typists are all liable to cramp of the hand, musicians may acquire callosities and emphysema, whilst clergymen, as well as housemaids, are said to be liable to inflammation of bursae associated with the knee joint. Clergymen also suffer from laryngitis, a disease which they share with teachers, singers, and public speakers. Medical men, in addition to the obvious hazards of infection, are reputedly prone to attacks of angina pectoris, perhaps in consequence

of the nervous strain to which they are subjected. The industrial diseases proper are governed by the Factories Acts, the most recent being passed in 1937 and 1948; the provisions of these Acts are supervised by inspectors of the Ministry of Labour and by examining surgeons specially appointed for the purpose. Most large factories now have their own medical and welfare workers. Many such diseases are subject to compulsory notification by medical practitioners; compensation of diseases and injuries is governed by the Workmen's Compensation Acts of 1925-46. Industrial diseases include anthrax, or wool-sorters' disease, which affects chiefly the lungs and spleen, and is often fatal; caisson disease, common in divers if they are released too suddenly from high pressures; cataract and emphysema, which occur in glass-blowers. Workers in mines, tunnels, and sewers are sometimes attacked by spirochaetal jaundice (Weill's disease) and by hookworm (ankylostomiasis, q.v.). Poisons which may affect workers include metals such as lead, arsenic, antimony, mercury, and nickel; non-metallic substances, as for instance phosphorus, carbon disulphide, and a large number of coal-tar products (benzene, aniline, trinitrotoluene, picric acid, etc.) used in dyeing and as explosives; gaseous poisons, e.g. chlorine, arsine, and the gases of coal-mines. Other very important O. D. are pulmonary tuberculosis, silicosis, and asbestosis, caused by the inhalation of foreign particles; also dermatitis, ulceration, and cancer of the skin induced by irritating chemicals, such as alkalis, paraffin, chromium salts, tars, oils, and the like. Finally mention should be made of the risks to operatives using radioactive substances in medical work and atomic bomb factories.

**Occupational Therapy.** psychological treatment, the success of which depends upon the transference of the patient's focus of attention from his disability to an objective centre, in this case to some congenial occupation. It originated as a treatment in mental hospitals, but it is becoming increasingly important in both general and mental hospitals. In mental hospitals activities are devised to hold the attention of the patient, and to encourage him to concentrate. In general hospitals O. T. is used whenever possible in conjunction with physiotherapy to stimulate circulation and muscle tone, and it plays an important part in the treatment of traumatic injuries, arthritis, tuberculosis, and paralysis. Among the many crafts which serve both to stimulate the interest of the patient, and at the same time to exercise special muscles, are weaving, spinning, table weaving, joinery, book-binding, leatherwork, pottery, rug-making, country dancing, and other recreational activities. Throughout the course of treatment the occupational therapist works under medical direction, in the early stages in co-operation with the nurses and physiotherapists, in the convalescent stage with technicians and recreational training experts, and in the final stages with industrial psychologists

and others. O. T. thus takes an important part in the eventual rehabilitation of the patient.

Experiments in O. T. were first carried out in Great Britain during the First World War, mainly by craft-workers untrained in the medical side. Between the 2 wars a group of people began to realise the importance of a specialised training for occupational therapists, and in 1930 Dr Elizabeth Casson founded the Dorset House School in Oxford. Other schools quickly followed, and the Association of Occupational Therapists was formed in 1936 with Sir Hubert Bond as president and Mrs Glyn Owens as first chairman. Membership is limited to those who hold the association's diploma, or that of an approved school obtained before the establishment of the association's examinations, the first of which was held in 1938. A fully qualified occupational therapist has a working knowledge of anatomy, physiology, psychology, and first aid, and also departmental management, general medicine, and surgery, together with some knowledge of either psychiatry, psychopathology, and O. T. applied to psychiatric conditions, or advanced anatomy and physiology, physical medicine, and orthopaedics, according to specialisation. Added to this is a knowledge of at least 10 crafts. See R. H. Finnegan, *Occupational and Physiotherapy*, 1948; E. N. M. O'Sullivan, *Textbook of Occupational Therapy*, 1955.

**O'Ceallaigh, Seán Tomas**, see O'KELLY, SEAN THOMAS.

**Ocean and Oceanography.** O.s or surfaces of continuous water, as distinct from the enclosed and shallow seas, cover about 140,000,000 sq. m., comprising 71 per cent of the total surface area of the globe. Their mean depth is estimated at 2080 fathoms (12,480 ft), as compared with the mean height of the land, 375 fathoms (2250 ft).

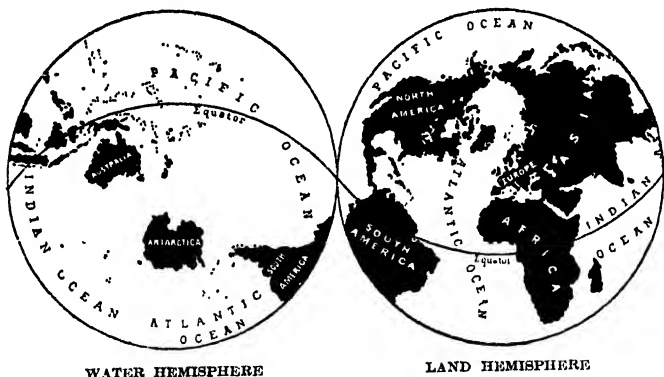
**Distribution.** In the N. hemisphere the proportion of land to water is 2 : 3; in the S., 1 : 4.7. There is a 'land hemisphere,' however, centred on the Bay of Biscay, in which the proportions are nearly equally distributed, and a 'water hemisphere' centred on the SW. Pacific, in which the water covers an area 10 times that of land. The arrangement of the O.s and the continents is an almost symmetrical alternation. The Arctic O. around the N. pole is antipodal to the high Antarctic continent. The S. circumpolar O. matches the almost complete ring of land round the Arctic basin.

The 2 great O.s, the Pacific and the Atlantic, cover sections of 150° and 90° respectively in the S. and then taper northwards between the continents to their shallow and narrow connections with the Arctic O. The Indian O. covers a sector of 120° in the S., and is enclosed by a semicircular sweep some 20° N. of the equator.

**Importance.** The greatest influence of the oceanic bodies of water is that of moderating and regulating the climatic conditions of the earth. They are the great source and store of moisture brought

by winds as cloud and rain to the lands. Their reactions with the sun's heat differ from, but delicately counterpoise, those of the land, and prevent the development of extremes of temp. in their bordering regions. In brief, proximity to the O.s determines to a very large extent the habitability, development, and even character of the pop. of certain regions, e.g. the monsoon countries of SE. Asia. The deep-sea fisheries centred off the banks or oceanic shallows are of vast importance, and the O.s also are of the greatest value as highways of commerce. The N. Atlantic O. may be regarded especially as one of the controlling factors in the supremacy and progress of the great W. European and Amer. peoples. Its contributing land margin is considerably more extensive than that of the Pacific

take place. The most striking fact is the uniformity of temps. at great depths in all lats., bottom temps. varying only from 30° F. in high lats. to 35–40° F. in the N. Atlantic and Pacific O.s. The freezing-point of sea water is about 28° F. In enclosed seas like the Mediterranean, anomalous conditions arise as the result of the presence of submarine barriers. Owing to the fact that the sun's warmth is not usually felt to a greater depth than 300 fathoms, there is a lag in the seasonal change of temp., and whereas in N. lats. the hottest time of the year is June, the water, on account of the slow warming up of the sea, does not reach its maximum temp. until Aug. There is a further lag in the warming of the deeper water, until at about 50 fathoms there is a complete reversal of seasons. There the hottest



or the Indian O., since much longer and greater rivs. drain into it. (For further special characteristics see ATLANTIC, PACIFIC, etc.)

**Temperature.** The mean ann. surface temps. of the O. vary from over 80° F. within the tropics to freezing-point in polar seas. The surface temp. of the sea changes markedly from place to place. In the tropics it is hot compared with the polar regions. The highest recorded temp. is 96° F. in the Persian Gulf, the lowest 28° F. in polar seas; and between these 2 extremes all temps. are to be found. The specific heat of sea water is high, and therefore, as compared with land, the O.s remain cool in summer and warm in winter, accounting indirectly for the oceanic climate of marginal lands. There is very little daily variation, and only a small ann. range of temp., a range of as much as 15° F. being exceptional at sea in surface waters. The vertical distribution of temp. has some notable features in common throughout the O.s. There is a small drop in the first 12 to 25 fathoms due to mixing by waves, a rapid decrease of temp. to about 200 fathoms, with a further slower fall to about 1200 fathoms, after which only slight changes

time of the year is in Dec., and the coldest about May–June. Below 100 fathoms there is no seasonal change at all in temp., and, year in year out, the conditions are uniform. From this depth downwards the temp. gradually falls until in the O. abysses it remains constantly at somewhere near the freezing-point.

**Pressure.** The pressure in the sea varies with the depth. At every 10 metres it is increased by one atmosphere, i.e. by one stone to the sq. in. In the great depths the pressures rise to 3 tons to the sq. in. Yet there is no part in the O.s in which animal life cannot be supported. The great pressures in the depths of the O. have a slight effect on the water's density, but, water being almost incompressible, the increase in density with depth is very small. One of the effects of living at these great pressures is that when animals are brought up quickly in a trawl they break to pieces on account of the sudden reduction of pressure. In the laboratory small unicellular animals have been subjected to pressures of as much as 600 atmospheres without suffering any apparent harm.

**Light.** The amount of light to be found at any depth of the O. depends on the



altitude and strength of the sun, on the weather conditions, and upon the turbidity of the water. It is seldom that all the light from the sun penetrates the actual sea surface; this only happens when the sun is vertically overhead and the sea perfectly calm. But the rays that do pass through the surface cannot penetrate to the bottom in very deep water. In the great O.s the darkness on the sea-floor, thousands of fathoms below the surface, is absolute, the light being absorbed completely by the water. But not all the different colours of which white light consists are absorbed to an equal extent; thus red rays are quickly absorbed but blue and violet light penetrates much further, while in clear O. waters, such as the Sargasso Sea, violet light may be present at over 500 fathoms, though its strength is necessarily very weak. An excellent example of the absorption of light by sea water is supplied by the celebrated cave at Capri called the Blue Grotto, within which everything is enveloped in the purest blue light. The explanation of this phenomenon is that the only light that can enter the cave itself has to pass first beneath the water which practically fills its narrow entrance. The blue colour of the sea is also due to the same phenomenon, for the colour of the water is due to the reflection of light upwards from the small particles suspended in the water; much of the remaining red and yellow light has become absorbed in this upward journey, and it is mostly the blue and green light which can survive to appear above the surface and so lend to the sea its typical hue. As all these rays of light are being absorbed in their downward passage it follows that the actual strength of the light is gradually being reduced as the water gets deeper. In the open O. the strength of light is too weak at 100 fathoms to support very much plant life, while below that depth few living plankton plants are to be found. None the less this upper layer of water, 100 fathoms thick, is sufficient to sustain a great mass of plant life that forms the sea's pasturage, and it is on the dead plants and organisms that have fed on them that the animals in the dark O. depths depend for their food.

**Composition and salinity.** Oceanic water contains nearly 200 times the dissolved salts of fresh water. Its 'salinity' is usually expressed as the amount of dissolved salts contained in 1000 parts of water, an average value being about 35 per 1000, or 3.5 per cent. Regions of heavy rainfall, slight evaporation, or large ingress of fresh water have a low salinity. In the Baltic Sea, for instance, the salinity is very low, being always below 29 parts per 1000. Down at the mouth of the Baltic, however, where it meets the North Sea in the Skagerrak, there is a considerable rise in the salinity due to the mingling of more saline waters from the North Sea itself and from water borne round by the drift of the Gulf Stream which penetrates the North Sea off the N. of Scotland. Regions of the trade winds and permanent anticyclonic conditions show high salinity,

but the enclosed seas, the Mediterranean and the Red Sea, are highest. The most striking contrasts of salinity, however, are a surface feature only, and are greatly reduced in deeper waters. In the case of the Dead Sea riv. water has been pouring down for thousands of years into a comparatively small lake in which constant evaporation is taking place, and, as a result, the enormous salinity of over 200 parts per 1000 has been reached.

The brine of O. waters consists of salt ions dissolved in the sea. On evaporation one kilogram of sea water with a salinity of 3.5 per cent will give salts in the following proportions.

*Grams of salt crystallising from one kilogram sea water; salinity 3.5 per cent*

Sodium chloride	27.213
Magnesium chloride	3.807
Magnesium sulphate	1.658
Calcium sulphate	1.260
Potassium sulphate	0.863
Calcium carbonate	0.123
Magnesium bromide	0.076

35.000

**Density.** This varies with both the salinity and the temp. on the surface. It also increases with depth from a mean of 1.025 at the surface to one of 1.028 at the bottom. Even small differences in density, however, have most important effects on oceanic circulation.

**Depth.** The greatest depth sounded (H.M.S. *Challenger*, 1951) is 5940 fathoms (6½ m.) in the Marianas trough, 200 m. SW. of Guam. The largest area is always that between 2000 and 3000 fathoms, 48 per cent in the Atlantic, 59 per cent in the Indian, and 65 per cent in the Pacific. Only 6 or 7 per cent exceeds 3000 fathoms, this comprising the elongate troughlike deeps; their breadth is of the order of 60 to 120 m. and their length one of several thousands of m. The majority of O. deeps have curved ground plans. These are especially abundant in the SW. Pacific. The Tonga trough and the Marianas trough are examples. The deepest sounding in the Atlantic is 5227 fathoms off Puerto Rico. Elsewhere the 'abyssal plain' has a configuration of depressions, rises, and plateaux, though details are only imperfectly known. At the margins it rises through the 'continental slope' to the 'continental shelf,' a sill of very varying breadth with a maximum depth of 100 fathoms. This has a very great influence on the tides.

The deposits on the O. bottom have been classed as follows:

(1) The *terrigenous*, including *littoral*, between high- and low-water marks, sands, gravels, muds, etc. *Shallow water and neritic*, less than 100 fathoms—the same plus organic remains. *Continental or hemipelagic*: blue mud, dark and slaty in colour, owing to the formation of ferrous oxide and ferrous sulphide from the ferric oxide in the presence of decomposing organic matter (shell fragments do not form a large percentage): red mud, in which the ferric oxide is sufficiently abundant

not to be completely reduced; and green mud, really another variety of blue mud characterised by the abundance of the green mineral glauconite of land or organic origin. Volcanic and coral muds and sands occur in the regions of volcanoes and coral formation.

(2) The *pelagic* or *deep sea*. These are oozes due to siliceous and calcareous organisms, mostly microscopic, including globigerina, very widely spread, especially in the Atlantic, pteropods, typical of the summits of rises, and diatoms (microscopic plants), covering an Antarctic belt and part of the N. Pacific. Red clay is found in the deepest parts of the O.s, especially the Pacific, while a local variety, radiolarian ooze, is limited to the deeper parts of the Pacific and Indian O.s. Around the poles, especially in the Antarctic O., the surface waters contain vast numbers of diatoms, each of which is enclosed in a delicate case of silica, and it is these minute plant 'skeletons' which form the prin. constituent of the deposits in these regions, hence called diatom ooze. Another type of deposit, which is strictly a variety of globigerina, is called pteropod ooze; it is named from the predominance in it of the limy skeletons of swimming snails known as pteropods or 'sea butterflies,' which are commonest near the equator, where this type of ooze is exclusively found, always in shallower water than globigerina ooze and, particularly, near coral is. and on submerged elevations far from land. Beneath a certain depth oozes with limy shells as their chief constituents are no longer found, all calcareous matter having been dissolved away. At the greatest depth of all even the silica of the minute animals known as radiolarians is dissolved and the deposits then consist exclusively of what Murray called 'red clay,' a true clay which has been formed by the prolonged action of the sea water on volcanic dust which is all that has remained after the long journey from the surface to the bottom. In this red clay are found spherules probably of meteoritic origin, and also the insoluble teeth of sharks and ear-bones of whales.

**Circulation.** The surface currents of the O. are due mainly to winds, though the shapes of land masses often control their direction. In each hemisphere great swirls (centred near Cancor and (Capricorn) are formed by the agency of the trades and westerlies, clockwise in direction in the N. hemisphere and anticlockwise in the S. hemisphere. These induce minor counter-currents along the equator. In the Atlantic and Pacific warm currents run off to the N. and S. along their W. sides, and cold currents flow from the Arctic and S. O. along their E. sides towards the equator. A belt current circles the globe in the 'Roaring Forties.' In the N. Indian O. the currents change with the monsoons. The influence of these currents, together with the winds above them, is the determinant of climate for oceanic land margins, a marked effect being that in the tropics, where the E. continental margins are warm and

humid, the W. tending to desert conditions. The warm and cold branches in higher lats. produce climatic contrasts in similar lats., as, for example, between W. Europe and Labrador. Within the great 'whirls' are large areas of practically still water, covered with a mass of living, floating weed known as sargassum. In addition to the surface circulation (see further ATLANTIC, PACIFIC, etc.) there are sub-surface currents which have only recently been investigated. These movements are in the nature of creeps affecting distinct zones or layers of water, differing in temp., salinity, and density. There is a definite bottom creep of very cold saline water from polar regions to the equator. Slow and more or less vertical currents are set up by the 'welling up' of this water, compensated by downward movements of dense saline water near the tropics. There is still a great need, however, for a more complete and systematic study of O. waters and their circulation.

*Life in the ocean* is made possible by the oxygen and carbon dioxide dissolved in sea water. The surface waters are normally saturated with oxygen, containing from 4.5 to 9 c.c. per litre, depending on the salinity and temp. The longer sea water has been removed from the surface the less oxygen it contains. In consequence the oxygen content falls off at depth, though plunging currents carry oxygen down from the surface. Surface waters contain about one-tenth of a gm per litre of carbon dioxide absorbed from the air. Respiration of animals and rotting vegetation contribute carbon dioxide, while it is removed by the photosynthesis of plants in the sea. (See further under BIOLOGY; BOTANY; FISH.)

*Scientific oceanographical investigation* received its great impetus in connection with the laying of submarine cables about 1855. Kircher had in 1664 attempted a map of O. currents, but before that interest lay in the wind circulation. Saussure made observations of temps. at great depths in 1780. Rennell attempted a scientific account of the currents between 1742 and 1830, while Arctic exploration added to knowledge. Capt. Cook, Sir John Ross, and others took true deep-sea soundings, and Brooke in 1850 introduced a method of sounding and obtained a sample of bottom-deposit at the same time. In 1857 H.M.S. *Cyclops* made observations of temp. with a self-registering sheathed thermometer. M. F. Maury pub. his *Physical Geography of the Sea* in 1856, the result of investigations organised by the U.S.A. Hydrographic Office, and this led to similar research being undertaken by many countries. In England Forbes, Michael Sars, Wyville Thomson, and Carpenter gave a start to marine biology. Their work led to the dispatch of the great *Challenger* expedition by the Brit. Gov. for complete investigation of the O. This great voyage, 1872-8, led to a systematic scheme of oceanography and to great improvements in instruments and methods.

Other famous expeditions sent out by many nations include *Vorign*, Norwegian, in N. Atlantic, 1876-8; *Travailleur*, French,

Bay of Biscay, 1880-3; *Ingolf*, Danish, 1896; *Blake and Albatross*, American, Atlantic, Caribbean, and Pacific, 1877-1901; *Princess Alice*, Prince of Monaco, N. Atlantic, from 1888; *Valdivia*, German, Atlantic, Indian, and S. O.s, 1898-9; *Siboga*, Dutch, Malay Archipelago, 1900; *Meteor*, German, S. Atlantic, 1925-7; *Albatross*, Swedish, Pacific O., 1947-8. The expeditions of the *Gauss*, *Belgica*, *Scotia*, *Fram*, *Discovery*, *Discovery II*, etc., added immensely to the science of marine biology and to the knowledge of conditions, especially in Arctic and Antarctic waters. An International Council for the exploration of the sea and marine laboratories in many parts of the world have been estab.

**Methods and instruments.** The increasing study of the O.s has resulted in a great improvement of methods and instruments used in deep-sea work. For sub-surface work special instruments, the actions of which can be controlled, have to be employed. Thus for temp. observations reversing thermometers, registering at any desired depth, are used. Samples of water for the determination of salinity are obtained by sending reversing water-bottles down to any required depth. Many instruments are used for the measuring of the velocity and direction of currents. Drifting objects, like icebergs, wreckage, or drift bottles, give information regarding surface currents, but for direct measurements of under-currents Ekman's ingenious self-recording current meter is favoured. Hydrometers and densimeters are employed for the determination of density and relative densities of samples. One of the most important branches of oceanographical research is deep-sea sounding. A depth sounding on the *Challenger* with the stout hempen cable and lead took sev. hours. With the modern Lucas sounding machine steel piano wire is run out from the drum until the sinker touches bottom and becomes detached, when the depth is automatically recorded. The latest method, however, is by echo-sounding apparatus, with which continuous soundings can be taken by a ship under way. Depth is calculated by timing the echo, or sound wave reflected from the sea floor, produced by a controlled explosion in the ship's bottom. Cores of the rocks underlying the O. floor can be obtained by allowing a tube to fall to the bottom or by firing a tube from a gun arranged to go off when the apparatus reaches the sea bed. In the latest sampler, a piston is mounted inside a tube; the tube is released into the bottom deposits, which it can penetrate for as much as 75 ft. Information as to the deeper-lying deposits below the sea bed is obtained by geophysical work; seismic, gravity, and magnetic surveys of the O. floor have been made (see CONTINENT and GEOPHYSICS). Dredges and trawls, up to 50 ft span, are used for obtaining specimens of bottom life, while tow-nets and vertical nets and traps, which can be opened or closed at desired depths, and which are made of extremely finely meshed silk, are used to capture

animals and plants in intermediate waters. Many marine organisms are so small, however, that they have to be concentrated into drops for microscopic examination by large and hand centrifuges.

**Permanence of the ocean basins.** There has been much discussion as to the permanence of the deep O. areas beyond the limits of the continental shelf. The absence of geological representatives on land of the deep-sea oozes led to the theory of permanence, particularly elucidated by Wallace, Lord Kelvin, and Jukes-Brown. They have, however, been recognised in such oceanic marginal lands as Barbados, Cuba, Borneo, and elsewhere. The distribution of plants and animals appears to require the non-permanence of O.s or the presence of 'land bridges' across present O. basins. Wegener has postulated the shifting of continents in the geological past by the splitting up of a large primeval continent and the drift of its parts towards the equator and towards the W. This continental drift theory is based on the well-established difference in the composition of the continental blocks and the O. floor. The former consist of lighter rock materials making up the 'sial', and are supported in the denser materials of the O. floor termed the 'sima'. They may almost be compared to icebergs floating in water. See also HYDROMETER; NAVIGATION; RIVER; SEA; SEA WAVES AND SWELL; TIDES; WIND.

See W. C. Thomson and J. Murray, *Report on the Scientific Results and Narrative of Cruise of H.M.S. 'Challenger', 1882-1895, and Summary of Scientific Results, 1897*; A. Wegener, *The Origin of Continents and Oceans* (trans.), 1924; G. Schott, *Géographie des océaniques Océans*, 1926; Sir J. Murray, *The Ocean*, 1928; T. W. Vaughan, *International Aspects of Oceanography*, 1937; H. U. Sverdrup, M. W. Johnson, and R. H. Fleming, *The Oceans, their Physics, Chemistry, and General Biology*, 1942; F. S. Russell and C. M. Yonge, *The Seas*, 1944; T. A. Ryder, *Mother Earth*, 1948; F. D. Ommaney, *The Ocean*, 1949; F. C. Lane, *The Mysterious Sea*, 1949; P. H. Kuenen, *Marine Geology*, 1950.

**Ocean Falls**, tn of Brit. Columbia, Canada, 350 m. NW. of Vancouver. There are large pulp and paper works. Pop. 2700.

**Ocean Island**, situated in the Pacific Ocean, 0° 52' S., 169° 35' E. In 1901 the is. was taken under Brit. rule, and in 1916 was formally annexed to the Gilbert and Ellice Is. colony. It is very rich in high-grade phosphate; in 1921 the Brit. Phosphate Commissioners purchased the working rights from the Pacific Phosphate Co. The Japanese occupied the is. during the Second World War until 1945, deporting the pop., which numbered 2500. O. Is. is 6 m. in circumference. After the war the native pop. was resettled in the is. of Rambi in the Fiji archipelago.

**Oceania**, general or collective name for the groups of is. in the S. and central Pacific Ocean or S. Seas, comprising all those intervening between the SE. shores of Asia and the W. shores of America.

Physically O. includes all the is. from Australia to the Marquesas and the Low Archipelago, and from New Zealand to the Hawaiian group. The main divs. of the regions are the 3 large is., Australia, Tasmania, and New Guinea, and the 3 is. groups Melanesia (q.v.), including the Solomon Is. (q.v.) and New Hebrides and New Caledonia, Micronesia (q.v.), including the Carolines and Ladrones, and Polynesia (q.v.), extending from New Zealand to Hawaii. The most important group is the Australian chain or chains stretching from New Guinea to Macquarie Is. and including the Papuan is. and New Caledonia. The grouping into Melanesia, Micronesia, and Polynesia is a loose ethnic classification. Most of the small is. are coral atolls, though some are of volcanic origin. O. is divided among Britain, France, Japan, Australia, New Zealand, U.S.A., and Chile.

**Oceanic Steam Navigation Company, see** CUNARD STEAMSHIP COMPANY.

**Océanie Française, see** FRENCH OCEANIA.

**Oceanus**, in Homer, a great belt of riv. sweeping round the earth, and the father of all things, even of the gods. Herodotus and the later Gk poets, e.g. Euripides, identify him with the sea, and later he became synonymous with the Atlantic. Hesiod makes him the son of Uranus and Gaia, the husband of Tethys, and the father of all the great rivs., besides 4000 sea nymphs or Oceanides.

**Ocellus, Lucanus** (fl. c. 500 BC), Gk philosopher of the Pythagorean school, named from his bp., Lucania in S. Italy. A few fragments of his works are extant; but a treatise *On the Nature of the Universe* once attributed to him is now recognised as spurious. There is an ed. with commentary in German by R. Harder, 1926.

**Ocelot, Panther-cat, and Tiger-cat** are popular names applied to *Leopardus pardalis*, a species of Felidae found in tropical America. It is a beautiful animal, averaging in length from 2½ to 3 ft, and has a tail about 1 ft long; the colour is usually tawny, with dark spots or bars. The O. is a good climber, and feeds for the most part on birds caught in its native forests.

**Oc-oo**, site of an anc. city, about 110 m. NE. of Camau Point in modern Cochinchina (q.v.). The site covers 450 hectares and was excavated by Louis Malleret, 1942-5. The city fl. between the 1st and 9th cents. AD, and must have formed part of Fu-nan (see ANGKOR). Inscriptions found on small objects are written in the Brahmi script of Sanskrit. Architecturally heavy masonry was supported on timber, which latter has collapsed with the consequent ruin of the whole structure. The reason for the decline of O. is unknown. See G. Coedès, 'Fouilles en Cochinchine, le site de Go-Oc-oo,' *Artibus Asiae*, vols. x-xiii, 1947; L. Malleret, 'L'Art et la métallurgie de l'étain dans la culture d'Oc-oo,' *Artibus Asiae*, vol. xiv, 1948; R. Grousset, 'Traces des Romains en Indochine,' *La Revue Française*, Dec. 1949; 'Les Fouilles d'Oc-oo, Rapport préliminaire,' *Bulletin de l'École Française d'extrême Orient*, vol. xiv, 1951.

**Ochil Hills**, range of hills in Scotland, in Perthshire, Clackmannan, Kinross, and Fife, extending for about 25 m. from the Firth of Tay to Bridge of Allan. The highest summit is Ben Cleuch (2363 ft). Coal, iron, copper, and lead are found, and rich pasture is afforded to sheep and cattle.

**Ochino, Bernardino** (1487-1564), It. reformer, b. Siena. A friar at first, he was vicar-general of the Capuchins, but, fearing the Inquisition, because of his heretical sermons, he fled to Geneva, and attached himself to Calvin. He confirmed his conversion by marriage, and after travelling as a Protestant preacher, accepted from Cranmer a prebend at Canterbury, and pub. in Lat. his spirited *Tragedy or Dialogue* against the Pope. But his apology for polygamy and his attack on the Trinity discredited him with the Reformers, and eventually he d. a miserable death from plague in Moravia. See lives by K. Berath, 1892, and E. Negri, 1912; also A. Stucki, *Christus in Italien*, 1936.

**Ochra, Okra, Gobbo, or Gombo**, names for the pods of *Hibiscus esculentus*, family Malvaceae, a tropical annual, cultivated in NW. India and America for food.

**Ochre**, name given to sev. varieties of native earths, which consist of a mixture of hydrated oxide of iron with silica and alumina. They range in colour from light yellow to brown. The incrustations of oxides of other metals, antimony, bismuth, nickel, etc., are also called O.s, though they are not so important. Red and yellow O.s are prepared by grinding and washing, and are extensively used as pigments. O. is found in sev. parts of Great Britain, notably in Anglesey and Devon; also in Canada, France, India, and S. Africa. See PIGMENTS.

**Ochs, A. Simon**, see 'NEW YORK TIMES.'

**Ochterlony, Sir David** (1758-1825), Brit. soldier, b. Boston, Massachusetts. He joined the Indian Army in 1777, and first distinguished himself as the defender, with a small garrison, of Delhi against Holkar's invading army of 20,000 (7-16 Oct. 1804) until the siege was raised by Lake's army. He held the Sikhs in check on the NW. frontier, and eventually concluded a treaty of peace with their leader, Ranjit Singh (1808). In 1814, in the campaign against the Nepalese, he captured the fort of Nalagur, and followed up this success by taking Maláun, which was defended by the gallant and skilful Amar Singh, whom O. permitted to march out with his arms and colours and personal possessions. O. was made K.C.B., and, later, baronet, and given a large pension by the E. India Co. (1815). Later, taking the field against the Ghurkhas, he advanced on Khatmandu, and defeated them decisively at Hariharpur. The Nepalese then ratified the treaty which previously they had rejected (1816). For these services O. received the thanks of Parliament and the award of the G.C.B. His last campaign was against the Maratha chiefs and the Pindaris, and he succeeded in dividing the 2 major bodies of the Pathan forces without striking a blow (1818). See C. MacFarlane, *Our Indian*

*Empire*, 1844; J. C. Marsham, *History of India*, 1867; Sir G. Dunbar, *A History of India*, 1944.

**Ochus**, see **ARTAXERXES III.**

**Ocimum**, genus of half-hardy annuals and shrubs (family Labiatae), bearing whorls of white flowers. *O. basilicum* is the sweet or common basil, which is grown in kitchen gardens. See **BASIL**.

**Ockham**, or **Occam**, **William of** (1290–1349), called 'Doctor Singularis et Invincibilis,' nominalist philosopher, was b. at O., Surrey. He probably studied at Oxford as a member of the Franciscan house there, but not, as has often been stated, at Morton College. In Paris he became associated with the celebrated Marsiglio of Padua, on whose political opinions he exercised considerable influence. Like his master, Duns Scotus, whose rival in philosophy he afterwards became, he belonged to the order of Franciscans. O.'s eminence rests on his work in logic, in philosophy, and in political theory. In his political writings he supported the secular power as against the claims of the papacy, and was cited before a papal court in consequence. In philosophy he revived the tenets of nominalism in a modified form. 'O.'s Razor' is a dictum which states *Essentia non sunt multiplicanda praeter necessitatem*—Essences are not to be multiplied without necessity. There is no ed. of the complete works. The political works have been ed. by J. I. Sikes and others (1940 ff.). O. must not be confounded with Wm de Ockham, Archdeacon of Stow in 1302. See further **KNOWLEDGE**. See E. A. Moody, *The Logic of William of Ockham*, 1935, and M. H. Carré, *Realists and Nominalists*, 1946.

**Ockingham**, see **WOKINGHAM**.

**O'Comhraíde**, **Eoghan**, see **O'CURRY**, **EUGENE**.

**O'Connell**, **Daniel** (1775–1847), 'The Liberator,' Irish patriot and orator, b. Curhan, near Cahirciveen, co. Kerry. In 1798 he was called to the Irish Bar. As a lawyer he displayed an exceptional gift for examining witnesses, whilst his vigorous and earnest oratory exercised a powerful influence over the jurymen, as later over the House of Commons, to which he was returned in 1828. The year 1829 saw the emancipation of the Catholics (see **CATHOLIC EMANCIPATION**), a reform which would never have come so soon had it not been for O'C. In 1841 O'C. began his second and greater agitation, this time for the repeal of the union. Peel was then at the head of a Tory Cabinet, and O'C. realised that the Catholics of his country would win nothing from a Tory gov. The activities of the Catholic Association were revived, and huge mass meetings were everywhere organised. O'C. felt confident of success, when he was condemned to prison on a charge of sedition (1844). A few months later he was set free, but ill health and the devastating famine in Ireland combined to defeat his ends. He d. at Genoa on the way to Rome in 1847. See **IRELAND, History**. See lives by W. Fagan, 1847; M. Cusack, 1872; J. O'Rourke, 1875; J.

Hamilton, 1888; D. Gwynn, 1929; see also J. O'Connell (ed.), *Life and Speeches*, 1846; W. J. Fitzpatrick (ed.), *O'Connell's Correspondence*, 1888; R. Houston, *Daniel O'Connell: his Early Life and Journal*, 1906; M. MacDonagh, *O'Connell and the Story of Catholic Emancipation*, 1929; M. Tierney, *Daniel O'Connell*, 1949.

**O'Connell School**, Dublin, secondary school for boys and the largest in the Rep. of Ireland. The foundation stone of this school was laid by Daniel O'Connell in 1828. It was primarily estab. as a model Catholic school for the city of Dublin. Many distinguished ecclesiastics as well as laymen have been educ. here.

**O'Connor**, **Feargus Edward** (1794–1855), agitator and Chartist, b. Ireland, and educ. at Trinity College, Dublin. He was called to the Irish Bar, but it is as a politician that he is remembered. He was an active supporter of the Reform Bill of 1832, and was returned to Parliament for co. Cork. After being unseated for lack of the required property qualifications he allied himself with the 'physical force' Chartists, and in 1846 was imprisoned for seditious libel. From 1847 he sat in the House of Commons for Nottingham, and led the great Chartist demonstration at Kennington in 1848; declared insane, 1852.

**O'Connor**, **Thomas Power** (1848–1929), Irish journalist and politician, b. Athlone, and educ. at Queen's College, Galway. He became a journalist in Dublin; later he became a sub-editor on the London *Daily Telegraph*, but gave this up for an appointment in the London office of the *New York Herald*. In 1880 he entered Parliament as member for Galway, and became a prominent personality in the Parnell party. In 1885 he ceased to represent Galway, and became M.P. for the Scotland div. of Liverpool. He remained so for the rest of his life, becoming Father of the House on the death of Campbell-Bannerman. He was made privy councillor, 1924. 'Toby M.P.' of *Punch* christened him 'Tay Pay.' His pubs. include *Lord Beaconsfield: a Biography*, 1879; *Gladstone's House of Commons*, 1885; *The Parnell Movement*, 1886; *In the Days of my Youth*, 1901; *Memoirs of an Old Parliamentarian*, 1929, and numerous essays. See life by Hamilton Fyfe, 1934.

**Ocotea**, or **Oreodaphne**, genus of tropical trees (family Lauraceae), bearing tough alternate leaves and racemes or panicles of small green flowers. *O. bullata* is sometimes grown in the greenhouse. *O. opifera* exudes a volatile oil.

**Ocotlán**, tn of Jalisco, in central Mexico, on the NE. shore of Lake Chapala (q.v.). O. is an agric. and food processing centre, and has an airfield. Pop. 14,300.

**Octahedrite**, see **ANATASE**.

**Octahedron**, see **POLYHEDRON**.

**Octane** ( $C_8H_{18}$ ), name given to those hydrocarbons of the paraffin series which contain 8 carbon atoms. There are 18 compounds having this formula, many being known. The normal O.,  $CH_3(CH_2)_6CH_3$ , is a colourless mobile liquid, sp. gr. 0.702 at 20° C., boiling point 125.5° C., and is found in petroleum. It may be obtained in the pure state by heating

oetyl iodide with zinc and dilute hydrochloric acid. It may also be synthesised by heating *n*-butyl iodide with sodium. Iso-octane ( $\beta$ -methylheptane) is a colourless liquid, boiling at 116° C., and has a sp. gr. of 0.7035; it may be synthesised by the action of sodium on a mixture of propyl and isoamyl iodides, and fractionally distilling the product.

**Octane Number**, percentage of an octane in a mixture of this octane with *n*-heptane which behaves, as far as 'knocking' in an internal combustion engine is concerned, with a petrol to be characterised by the O. N. The octane shows little tendency to 'knock,' but the heptane has a very low resistance to it. Hence a petrol with a high O. N. will not 'knock' easily.

**Octave**, interval in music comprising 8 notes of the diatonic scale, called the tonic, supertonic, mediant, subdominant, dominant, submediant, leading-note, and O. It has 4 intervals of a whole tone and 2 of a semitone in its diatonic form, or 12 semitones with the chromatic notes included. The O. of any note always has exactly double the number of vibrations per second of that note, giving the ear an effect of unison. There are usually 7 O.s in the pianoforte. In eccles. usage the O. of a festival is the period of 8 days including and following the festival, or the seventh day after it. Thus New Year's Day is the O. of Christmas Day.

**Octavia**: 1. Sister of the Rom. Emperor Augustus. She married first Marcellus, consul in 50 BC, and on his death (40) became the wife of Mark Antony, who quickly abandoned her for Cleopatra. To Marcellus she bore a son; to Antony 2 daughters, one of whom married into the Claudian house.

2. Daughter of the Emperor Claudius and Messalina, b. c. AD 40, and wife of Nero, who in AD 62 divorced her on account of her being barren, and later accused her of unfaithfulness. He had her put to death in the same year.

**Octavo**, term used in bookbinding for a book or sheet of printed paper which has been folded 3 times, or one-eighth of its original size, so forming 8 leaves or a section of 16 pages. The word O. is generally abbreviated to 8vo, and certain sizes of books are classified as foolscap 8vo, demy 8vo, royal 8vo, crown 8vo. See PAPER.

**Octet**, composition for 8 instruments, usually in sev. movements, and in some kind of sonata or suite form. An O. may also be vocal, but would not then be given the name O. as a title, and it would probably be merely an incidental section for 8 voices in a larger composition. Thus the double quartet 'Lift thine eyes' in Mendelssohn's 'Elijah' is only an O. in fact, while his O. for strings is one in name and form as well.

**October** (Lat. *octo*, eight), originally the eighth month of the old Rom. calendar, the year beginning in Mar. It retained its old name in the Julian calendar, but then became the tenth month with 31 days. The Slavs term it 'yellow month,' from the falling of the leaf, and an old name for it in Germany was 'wine month.'

In England it has long been the chief month for brewing.

**October Revolution**, seizure of power by the Bolsheviks in Russia on 7 Nov. (25 Oct. Old Style) 1917. The Military Revolutionary Committee of the St Petersburg Soviet (see SOVIETS), composed of Bolsheviks, Left Socialist Revolutionaries (see SOCIALIST REVOLUTIONARIES), and Anarchists, overthrew Kerensky's Provisional Gov. (q.v.) with the help of the Red Guards (q.v.), whereupon a new 'Provisional Workers' and Peasants' Gov.' was set up—the Council of People's Commissars headed by Lenin. See also KERENSKY; LENIN; TROTSKY. See W. H. Chamberlin, *The Russian Revolution*, New York, 1935, and E. H. Carr, *The Bolshevik Revolution*, vol. 1, 1950.

**Octobrists**, Russian political party, so called after the Imperial Manifesto of 17 Oct. 1905 which introduced the constitution. O. were right-wing liberals and drew their support from the right wing of the Zemstvo (q.v.) movement, business men, and liberal civil servants. Their leader was A. I. Guchkov. They were the majority party in the 3rd and 4th Dumas (see DUMA), and participated in the 'progressive block' (see CONSTITUTIONAL DEMOCRATS) during the First World War and in the Provisional Gov. (q.v.) in 1917.

**Octomeria**, genus of small epiphytals, tropical Amer. orchids, bearing yellow, purple, and white, spotted with red, flowers. They are grown in moist, fibrous peat and sphagnum in the warm greenhouse.

**Octopus**, name for species of dibranchiate cephalopods, with 8 arms and without the internal shell or 'bone' which is found in the mantle of many cephalopods. The body is oval or rounded, and the suckers are generally sessile. O.s are widely distributed on the shores of almost all temperate and tropical seas, and do not attain the great size of some of the squids, although the giant O. of the N. Pacific may have a span of 30 ft. The mature females are extraordinarily prolific, and may lay as many as 50,000 eggs in the course of a few days. The eggs resemble grains of rice in appearance, but are translucent and are attached to a common stalk in clusters of about 1000 each. These are fixed to a rock or stone, and, as Aristotle knew, the period of incubation is 50 days. The female watches over them with ceaseless attention the whole time. O.s spend the day-time lying hid in the shadow of rocks, but are more active at night. Their powers of colour change have often been observed.

**Octoroon**, see MULATTO.

**Octroi**, term used with special reference to the system of duties imposed on certain essential commodities coming into different dists. or municipalities, a kind of inland tariff. The system formerly prevailed in France and in sev. other continental European countries. Six prin. classes of commodities were taxed in France, and 6 types of area existed (reduced to 3 in 1941) until the system was discontinued in Jan. 1949. Certain large

Fr. tns had abolished the O. before the Second World War; it was abolished in Paris in Aug. 1943. It was still operating in parts of Italy, the Iberian peninsula, and Austria, in 1946.

**O'Curry, Eugene** (Gaelic, **Eoghan O'Comhraidhe**) (1796-1862), Irish scholar, b. Dunaha, co. Clare. He was first employed in the topographical and historical section of the Irish Ordnance Survey, and in 1854 was appointed first prof. of Irish hist. and archaeology at the Catholic Univ. of Ireland. His *Lectures on the Manuscript Material of Ancient Irish History*, 1861, is one of the standard accounts of Irish medieval literature.

**Oda the Good**, St. (d. 958), Archbishop of Canterbury, b. E. Anglia of Dan. parents. He became archbishop in 942, and prepared the way for the monastic restoration under St Dunstan.

**Odal**, see ALLodium.

**Oddfellows**, members of a friendly or benefit society, whose fundamental principle is the obligation to render assistance to every member who applies for it in sickness, distress, or other misfortune. The largest order of O. in the world is the famous Manchester Unity Independent Order of O., estab. in 1810. This society, with the Grand United and sev. other orders of O., has long appropriated to itself this once generic name. Any respectable person not under 16 or over 50 may be proposed for membership by a subscribing member. There are also juvenile and female lodges and members. The contributions are graduated according to the age of the member, and benefits are payable throughout life or until pension age, according to the insurance effected. At the end of 1956 the Manchester Unity had a gross membership of 649,275 (including members overseas), with capital of over £34 million. Oddfellowship was introduced into the U.S.A. from the Manchester Unity in 1819; the Grand Lodge of Maryland and U.S.A. was formed in 1821. Connection was severed with the Manchester Unity in 1842, and the U.S. order rivals in influence the Manchester Unity, the 2 orders now having inter-fraternal arrangements. The first Canadian lodge was opened in 1843 at Montreal. There are many lodges in Australia, New Zealand, S. Africa, and other Brit. dominions, and in the U.S.A. Other branches flourish in France, Switzerland, Denmark, Norway, and Sweden. See also FRIENDLY SOCIETIES.

**Ode** (Gk *ōdē*, a song), rhymed or (rarely) unrhymed lyric, frequently in the form of an address, usually exalted and stately in style, and often in varied or irregular metres, the length being commonly between 50 and 200 lines. The term originally meant any poem adapted to be sung, and in ancient Gk poetry there were 2 main types: the dignified lyric poem, such as Sappho's celebrated 'Ode to Aphrodite,' and the formal choral O. of Pindar and the dramatists, which employed elaborate though regular stanza forms. The lyric type was followed in Latin by Horace, whence it is sometimes called Horatian. In English he had many

imitators, such as Spenser in his 'Epithalamion' and 'Prothalamion,' Milton in 'On the Morning of Christ's Nativity,' Shelley in his 'Ode to a Skylark,' Keats in his 'Ode to a Nightingale,' Tennyson in his 'Ode on the Death of the Duke of Wellington,' Coventry Patmore in the series of O.s 'To the Unknown Eros,' and a host of other poets. The second type, or Pindaric O., was introduced into Eng. literature by Abraham Cowley, who, however, did not realise that Pindar followed an exact set of rules in his stanza formations. Hence the 'false Pindaric,' in which the stanza is varied irregularly and arbitrarily to suit the poet's meaning. Among the best known of this type are Dryden's 'Alexander's Feast,' Wordsworth's 'Ode on the Intimations of Immortality,' which is possibly the finest of all, and Francis Thompson's 'Hound of Heaven.' The true Pindaric, in which stanzas are made to correspond strictly with one another, was essayed by Gray in his 'Bard' and 'Progress of Poesy,' but such complicated rhyme and rhythm schemes do not accord well with the Eng. genius, and have seldom been really successful. In modern times the O. has fallen into disfavour because of its formality, which too often degenerated into pompousness, as in the elaborate O.s written to order by the less inspired Poets Laureate. See also LYRIC.

**Odell, Jonathan** (1737-1818), b. New Jersey, was one of the Amer. loyalist colonists who made himself celebrated as a satirist whose verses were directed against those who led the war for independence. He studied at Princeton, entered the medical profession, and then became a minister with a par. at Burlington, New Jersey. After the outbreak of hostilities between the Amer. colonists and England, O. voiced the feelings of a large number who remained true to their allegiance to the Brit. Crown. In 1776 he wrote an ode in celebration of King George III's birthday, and had to escape to New York, where he became a chaplain in the royal army. He continued to put his muse to the service of England, his best-known production being *The American Times*, 1780. After independence was won by the colonists he remained unreconciled, and went to Nova Scotia, where he and his descendants took a part in the public life of that settlement.

**Odell, Thomas** (1691-1749), dramatist, b. Bucks. He wrote political lampoons for Walpole, and estab. a theatre in London in 1729. In 1738 O. was deputy-licenser of the stage. His plays are *The Chimera*, 1721 (anonymously), *The Patron*, 1729, *The Smugglers*, 1729, and *The Prodigal*, 1744.

**Odenburg**, see SOPRON.

**Odenaalsrus**, tn of the Orange Free State, S. Africa, 40 m. SW. of Kroonstad. In April 1946 gold was found, the assay result of 23,047 in.-dwt. being the greatest ever recorded in S. Africa; Sir C. Oppenheimer described it as 'the most significant happening to S. Africa since the finding of diamonds in Kimberley and gold on the Witwatersrand.' (Nothing

approaching this borehole assay had ever been recorded in gold-mining in S. Africa—Rand ore, for example, running at about 250 in.-dwt.) About a dozen mines have been estab. in the dist. and there has been much regional development including a large irrigation scheme. Aerodromes have been constructed, and O. has been linked with the main railway line; a power station has been built at Vierfontein at a cost of £17,000,000. Pop. 12,463. *See* S. D. Jacobsen, *Free State and New Rand Gold*, 1940.

**Odense:** 1. Amt. in Denmark, on N. Fyn Is.; it includes the is. of *Baage* and *Faeno* in the Little Belt. Dairy farming is carried on. Area 700 sq. m.; pop. 196,210.

2. Cap. and important port of the above and of Fyn Is., on the Odense R., 87 m. WSW. of Copenhagen. Main industries are textiles, electrical equipment, foundries, sugar refineries, and shipbuilding yards. O. exports agric. and dairy produce. The tn has been a bishop's see since the 10th cent. King Canute II and other Dan. kings are buried in the Gothic cathedral, and it was the bp. of Hans Christian Andersen (q.v.), whose home contains a museum. Pop. 105,915.

**Odenwald**, mountainous region of SW. Germany, running W.-E. across S. Hesse, N. Baden-Württemberg, and B. Bavaria (q.v.). It lies S. of the R. Main (q.v.). The chief summits are Katzenbuckel (2057 ft), Neunkircher Höhe (1985 ft), and the Krähberg (1965 ft). It is well wooded, and there are many old castles on its heights.

**Oder** (Czech, and Polish *Odra*; auct *Viadua*), riv. of Europe, which rises in Moravia (q.v.), and flows N. through the 'Moravian Gate' in the Sudetic Mts, across the Polish provs. of Opole, Wrocław, and Zielona Góra, and enters the Baltic through the Stettiner Haff (q.v.). Its prin. tribs. are the Warthe and the 2 Neisse (q.v.) rivs.; together with the Lusatian Neisse it has formed since 1946 the boundary between Germany and Poland. It has extensive canal systems connecting it with the Spree, Havel, and Vistula, and the rich industrial area of Silesia (q.v.). Length 538 m.

**Oderisius** (d. 1105), It. monk, was educ. at Montecassino, where he became a Benedictine and, after holding various eccles. offices, was elected abbot. A poet and a patron of scholars, he mediated between the crusaders and Alexius, the Gk emperor.

**Odescalehi, Benedetto**, *see* INNOCENT (popes), *Innocent XI*.

**Odesa** (Ukrainian *Odesa*): 1. Oblast in SW. Ukraine, adjacent to the Black Sea and including S. Bessarabia. It is largely fertile black earth lowland with some oak forests in the hilly N. There are metal-working and food industries; wheat, maize, and sunflower growing, viticulture, cattle and hog raising, and fishing are carried on. The prin. tns are O., Belgorod-Dnestrovskiy, and Izmail. The area E. of the Dniester was annexed to Russia in 1791 and formed a part of

New Russia (q.v.). Area 13,000 sq. m.; pop. (1956) under 1,943,000, mostly Ukrainians and Russians. For the hist. of S. Bessarabia *see* Bessarabia.

2. Cap. of the above (known as Khadzhibey until 1794), a major economic and cultural centre of the U.S.S.R. It lies on the O. Bay of the Black Sea. It has large engineering industries (machine tools, ships, agric. machinery, automobiles, food industry equipment, and cranes), also food, textile, and chemical industries. It is a very important transportation centre with a seaport (the second largest in the country after Leningrad), 3 railway lines and an airport. There are sev. beach and mud health resorts near by. The univ., founded in 1817 as the Richelieu Lyceum, was transformed into the univ. of New Russia in 1865, abolished in 1920, but re-estab. in 1933. O. has a Conservatoire (founded 1913) and many other higher educational estab., a municipal library (1830), an opera and ballet theatre (1809), a hist. museum (1825), and a picture gallery (1898). O. is one of the best-planned Russian cities and has sev. notable 19th-cent. buildings in the classical style. Pop. (1956) 607,000 (fourth in the Ukraine and thirteenth in the U.S.S.R.; 1897, 404,000; c. 1914, 630,000; 1923, 317,000; 1926, 421,000; 1939, 604,000), consisting of Russians, Ukrainians, and Jews.

Known since the 14th cent., O. belonged to Lithuania, then to the Crimean Tatars, and became Turkish in 1764; the Turkish fortress was stormed by the Russians in 1789 and annexed in 1791. It became the residence of the Viceroy of New Russia in 1805. Thanks to the *porto-franco* régime (1819-49), O. rapidly became the second largest foreign trade port in the country (grain export); industrial development dates from the second half of the 19th cent., with food and light industries at first. O. was a centre of *émigré* Gk and Bulgarian patriots, who played an important part in the liberation of their countries from the Turks. It was also a centre of the Ukrainian cultural and national movement, of Jewish culture, of the labour movement, and of social democracy. It was bombed by the Allies in 1854 during the Crimean War, and suffered sev. Jewish pogroms. Occupied by the Austrians in 1918, it changed hands sev. times during the Russian Civil War, and after a heroic defence was occupied by the Rumanians during 1941-4, becoming the cap. of Transnistria (q.v.).

**Odessos**, *see* VAINA.

**Odets, Clifford** (1906-), Amer. playwright, b. Philadelphia, of Lithuanian origin. After an early career as an actor, he became associated with the Group Theatre in New York in 1930, and his first play *Awake and Sing* was produced by the group in 1935. In the same year he made his name with a one-act play, *Waiting for Lefty*, written for the New Theatre League. The play, based on the New York cab strike of 1934, was sensational for its social implications. Other plays include *Still the Day I Die*, 1935, *Paradise Lost*, 1935,



*Golden Boy*, 1937, *Night Music*, 1940, *Clash by Night*, 1941, *The Big Knife*, 1949, *Winter Journey*, 1952, and *The Flowering Peach*, 1955. His work shows the influence of Sean O'Casey (q.v.).

**Odeum**, or **Odeon** (Gk *ōdeion*), among the ancients the name for a public building devoted to performances of vocal and instrumental music. The O. was smaller than the dramatic theatre, and usually roofed in. The oldest known in Greece was the Skias at Sparta (c. 600 bc). The O. of Pericles on the SE. slope of the Acropolis was completed about 445; that of Herodes Atticus or Regilla on the SW. slope of the Acropolis was built about AD 162. Domitian built the first in Rome.

**Odger, George** (1820-1877), trade unionist, a shoemaker who in 1862 became secretary of the London trades council. He made 5 attempts, all unsuccessful, to enter Parliament. In 1864 O. organised the meeting which resulted in the formation of the Working Men's International Association, the president of which he became in 1870.

**Odhreir**, in Norse mythology, name of the cauldron containing a magic potion, the mead of poets, made by the dwarfs. Fjalar and Galar, from honey mingled with the blood of Kvasir, the wisest of men. The potion conferred wisdom, knowledge of runes and magic charms, and the poetic faculty.

**Odriel**, see RHO TINTO.

**Odilo**, St (c. 962-1049), b. of the noble family of Merceur in the Auvergne. In 991 he became abbot of Cluny, and under his rule the Clunian houses increased from 37 to 65. Known throughout Christendom for his liberality to the poor, he was a friend of popes and princes, and the promoter of the Truce of God, and instituted in 1031 the annual commemoration of the faithful departed. His feast is on 1 Jan.

**Odilon-Barrot**, see BARROT, CAMILLE HYACINTHE ODILON.

**Odin**, **Woden**, **Wotan**, or **Wuotan**, supreme Norse god, identified under Rom. influence with Mercury (see MERCURIUS), whose day was teutonised into 'Woden's Day' (Wednesday). O. was the source of wisdom and valour, and patron of culture and heroes. He was probably originally a storm-god, his name signifying 'mad' or 'the raging one.' He is attended by 2 ravens and 2 wolves, and rides the horse Sleipnir. He was the god of war, leader of hosts, giver of victory, in whose name the old tribes took possession of Britain, from whom both the royal houses of the rival kingdoms of Deira and Bernicia claimed descent, the great chief of Valhalla, and especially the god of those who were hanged, the gallows being known as his steed. Mimir, his uncle and the keeper of the magic cauldron, Odhreir (q.v.), gave him a potion from it, but O., by a trick gained possession of it himself. The first war of the world began by his hurling his spear, Gungnir, into the ranks of the Vanir (gods of the atmosphere). O. could take what form he chose from snake to eagle and often visited earth in disguise. He was one of the 3 sons of Borr, the son of

Bori, said to have been licked out of the salt ice-block by the cow Audhumla; his wife was Frigga and his son Balder (q.v.).

**Odo**: 1. **Of Beauvais**, St (801-80), gave up a military career to become a Benedictine at Corbie, becoming tutor to the sons of Charles Martel. He became Bishop of Beauvais in 861, and his reforms had great influence on the whole church of N. France. He mediated between Hincmar of Rheims and Pope Nicholas I.

2. **Of Cluny**, St (c. 879-942), Fr. abbot, b. Maine. In 909 he became a Benedictine at Banne, and in 927 became abbot of Cluny. Under his gov. the monastery began to exert its influence throughout France and in Italy. O. greatly enhanced the prestige of the Benedictine order.

3. (c. 1036-97) Bishop of Bayeux, half-brother to William the Conqueror and co-regent of England with Wm FitzOsbern in 1067. After the N. revolt had been suppressed, Kent was assigned to O., who thenceforth was one of the leading barons; but, for conspiring against Wm Rufus, he was expelled in 1088. He fled to Normandy and d. at Palermo, on the first crusade.

4. **Of Cambrai** (1050-1113), Fr. bishop, b. Orleans. In about 1090 he founded a Benedictine community at Tournai; in 1105 he was made Bishop of Cambrai, but refused to receive secular investiture, and d. in exile. He was one of the most learned Fr. scholars of the 11th cent.

5. **Of Lagery**, see URBAN (popes). *Urban II.*

**Odoacer**, **Odoacar**, **Odoacer**, or **Ottokar** (c. 435-93), Ger. soldier, a noble from one of the Danubian tribes. He became a captain in the imperial bodyguard at Rome, and, by leading a revolt and de-throning Romulus Augustulus, he estab. in 476 on It. soil in place of the imperial gov. a Ger. kingdom which was recognised by Zeno. He took the title of King of Italy, and reigned till his power was overthrown by Theodoric, King of the Goths, in 493. O. was then put to death.

**O'Donnell, Leopold, Duke of Tetuan** (c. 1809-67), Sp. general and statesman, b. Santa Cruz, Teneriffe, of Irish extraction, entered the army at an early age, fighting for the queen against the Carlists in the civil war (1833). In 1840 he sided with the queen mother, Maria Christina, and shared her exile in France. He became the enemy of Espartero, whom he drove from power in 1843, but 2 years later was appointed minister of war under Espartero, and in 1859, as Prime Minister, led an expedition against the Moors, for which he received his dukedom.

**O'Donovan, John** (1809-81), historian and archaeologist, b. co. Kilkenny. He prepared a trans. of the Brehon laws, and worked on the ordnance survey of Ireland. In 1832-6 he wrote a trans. of the *Annals of Ireland by the Four Masters*, pub. 1848-51. He also trans. and ed. for the Irish Archaeological Society *The Banquet of Dun nan Gadh and the Battle of Magh Rath*, 1842. In 1845 he pub. a grammar of the Irish language.

**Odontoglossum**, genus of orchids, most

of which can be successfully grown in a cool house, and which, on account of the beauty of their flowers and their general grace, are the most popular orchid genus. Most of them are natives of S. America. The flowers are borne on a long spike from 5 to 40 in number, and in a few species these spikes are branched and bear a hundred or more blooms. The colours are chiefly brown, yellow, or white, and are often spotted.

**Odontognathae**, group of birds found only in the fossil state, and characterised by having true teeth in their jaws. It includes the important Cretaceous genera *Hesperornis* and *Ichthyornis*.

**Odorico** (1286-1331), It. monk, b. Pordenone or Portenau in the Friuli. He became a missionary, and travelled over the greater part of Asia. An account of his journeyings is contained in his *Life and Travels*, pub. after his death. See G. Venni, *Elogio storico alle gesta del Beato Odorico*, 1761.

**Odour**, Perception of, see NOSE.

**Odovacar**, see ODOACER.

**O'Dowd, Bernard Patrick** (1866-1953), Australian lawyer and poet, b. Beaufort, Victoria. He became assistant librarian of the Victorian Supreme Court from 1887 to 1913, and later was parl. draftsman. Believing that poetry should deal with contemporary questions, he gained a high reputation as an intellectualist and socialist poet. Vols. of his verse are *Dawnward*, 1903, *The Silent Land*, 1906, *Dominions of the Boundary*, 1907, and *The Bush*, 1912; his *Collected Poems* were pub. in 1941. See also AUSTRALIAN LITERATURE. See life by V. Kennedy and N. Palmer, 1954.

**Odra**, see ODER.

**O'Duffy, Eoin** (1892-1944), Irish politician and soldier, b. Monaghan and educ. as an engineer. He took a leading part in the Sinn Féin (q.v.) movement and in the Irish Republican Army (q.v.), but he broke away from de Valera (q.v.) on the estab. of the Irish Free State (q.v.). When the Fianna Fáil (q.v.) gov. was formed in 1933, O'D. was dismissed from his post of chief commissioner of the civic guard. He became an admirer of Fascist ideas after meeting Mussolini, and formed a so-called National Guard, the 'Blue-shirts', later renamed the National Corporative Guard. This organisation was dissolved by the gov. as a subversive body. During the Sp. Civil War he led an Irish brigade to Spain to fight for Gen. Franco, but it returned after a few months. His book, *The Crusade in Spain*, appeared in 1938.

**O'Dwyer, Sir Michael** (1864-1940), administrator, educ. at St Stanislaus College, Tullamore, and Balliol College, Oxford. He entered the Indian civil service in 1885 and, in a long administrative career, held the posts of resident at Hyderabad (1908); agent to the governor-general for central India (1910), and governor of the Punjab (1913-19). His term of office in the last post coincided with a stormy period in the political life of the Punjab, and during the last year of his governorship the Amritsar incident

occurred in which sev. hundreds of people were killed. He was a consistent opponent of the Indian constitutional reforms, holding that they would be disadvantageous to the Muslim pop. In his book, *India as I Knew It*, 1925, he gave an account of the period during which he was governor of the Punjab, and defended his attitude at the time of the Amritsar incident. He was assassinated at Caxton Hall, Westminster, by an Indian.

**Odysseus**, see ULYSSES.

**Odyssey**, see HOMER.

**Oecumenical Movement**, see ECUMENICAL MOVEMENT.

**Oecumenius**, Bishop of Trikka in Thessaly, in the 9th or 10th cent. To him are attributed sev. commentaries in Greek on books of the N.T. His works were pub. at Paris in Greek and Latin in 1631.

**Oedema**, see DROPSY.



OEDIPUS AND THE SPHINX  
From a vase painting.

**Oedipus**, son of Laius, King of Thebes, and of Jocasta, whose father, warned by an oracle that he would perish at the hands of his offspring, exposed him on Mt Cithaeron, whence he was rescued by a shepherd of King Polybus of Corinth. The child was brought up at Corinth as the king's son. When a man he was told by the Delphic oracle not to return home as he must inevitably kill his father and marry his mother. He therefore fled from Corinth, and on his way to Thebes slew Laius in a quarrel, unaware of his identity. O. then delivered the country from the Sphinx (q.v.) and was rewarded with the hand of Jocasta, by whom he had Eteocles, Polynices, Antigone, and Ismene. In punishment for this incest Thebes was devastated with a plague, and the oracle declared the country could only be delivered by the expulsion of the murderer of Laius. O. made careful inquiries, and discovered to his horror that he was guilty. Jocasta hanged herself, and O., having put out his eyes, left Thebes, led by his daughter Antigone, and d. at Colonus, near Athens. See the

*Oedipus Tyrannus* and *Oedipus at Colonus* of Sophocles.

**Oedipus Complex**, see PSYCHOANALYSIS.

**O.E.E.C.**, see ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION.

**Oehlschläger, Adam Gottlob** (1779–1850), Dan. poet and playwright, b. Copenhagen. Decisive in his literary development was an encounter with Henrik Steffens, who converted him to Romanticism. Immediately after meeting Steffens, O. wrote *Guldthornene*, which was in a completely different vein from his earlier work and led to his becoming the leading romantic poet of Denmark. His *Digte*, which appeared in 1803, marked the commencement of a new era in Dan. literature. Two years later he pub. 2 vols. of *Poetiske Skrifter*, and then travelled on the Continent for 4 years, writing some of his most famous N. tragedies: *Hakon Jarl*, *Baldur hin gode*, *Palnatoke*, and *Arel og Valborg*. In 1810 he returned to his native place, and was appointed to the chair of aesthetics in the Copenhagen Univ. Other pubns. include the Nordic verse cycle *Helge*, 1814, *Nordensgude*, 1819, and *Dina*, 1842, the most successful of the later tragedies. In 1830–1 he pub. his autobiography, and in 1850 his reminiscences. See lives by K. Arentzen, 1879, and Y. Nielsen, 1879. See also I. Falbo-Hansen, *Oehlschlägers nordiske Digtning*, 1921, and *Breve til og fra Oehlschläger*, 5 vols., 1945.

**Oenone**, daughter of the riv.-god Cebren and wife of Paris, son of Priam, King of Troy, who afterwards deserted her for Helen. See Ovid, *Heroides* v. and Tennyson, *Oenone*.

**Oenothera**, genus of hardy annuals, biennials, and perennials (family *Oenotheraceae*), natives of America. *O. biennis* is the fragrant, yellow-flowered evening primrose which has so long been grown in gardens that it has become naturalised. Some other species are, like it, night-flowering, but many, notably *O. fruticosa*, bloom only in the day. 'Spats' or mutations of *O. lamarckiana* were studied by de Vries and used as the foundation for his theory of evolution by mutation.

**Oerebro** (Sweden), see ÖREBRO.

**Oersted, Hans Christian** (1777–1851), Dan. physicist, b. Rudkøbing. He was appointed prof. of physics at Copenhagen in 1806. His greatest discovery was the result of experiments on the magnetic needle with the electric current, described in his *Experimenta circa Effectum Conflictus Electrici in Aëre Magnetica*. The O., the unit of magnetic field strength, was named after him. He also pub. a *Manual of Mechanical Physics* and wrote numerous studies in chem., popular science (especially *The Soul in Nature*, 1856), metaphysics, etc. Most of his works have been trans. into German. See life by J. C. von Hauch and P. W. Forchhammer, 1853.

**Oesel**, see SAAREMAA.

**Oesophagus**, see GULLET.

**Oestridae**, family of dipterous insects, consisting of large hairy flies with very short antennae enclosed in a cavity in the fore part of the head, with rudimentary

mouth parts. The larvae are nearly all parasitic on mammals, and the perfect insects are well known as the obnoxious bot-flies. The larvae of *Oestrus ovis* infest sheep; those of *Gastrophilus equi* pupate in horses; while the larvae of *Hypoderma lineata* and *H. bovis* are found in cattle.

**Oestrous Cycle** and **Oestrogens**. The O. C. is the reproductive cycle of female animals, especially mammals. On one or more occasions during the breeding season the female is receptive to the male and is said to be 'on heat'; this is the period of *oestrus* and is accompanied by ovulation, i.e. the discharge of an egg from the ovary. *Oestrus* is preceded by a period known as *pro-oestrus*, when the vagina swells and becomes increasingly vascular, in preparation for coition, and it is followed by the period of *post-oestrus*, when the uterus hypertrophies ready to receive the egg if fertilisation has occurred, so that *post-oestrus* then merges into pregnancy. If fertilisation has not taken place, *oestrus* is succeeded by the resting period of *anoestrus*, preparatory to a repetition of the whole O. C. The menstrual cycle of women corresponds to the O. C. of other mammals, but it is distinguished particularly by the bleeding of menstruation which is absent or inconspicuous in other species.

The changes occurring in the O. C. are brought about by a hormone or *oestrogen* produced in the ovary, and responsible also for the development of the secondary sexual characters (as for instance the breasts) at puberty. The oestrogen produced by the ovary is *oestrin* (or *oestrone*) with the formula  $C_{18}H_{26}O_2$ , but other similar synthetic compounds such as stilboestrol have now been prepared and are useful in medicine, e.g. for treating the disorders of the menopause when there is a deficiency of natural oestrin.

**O'Faoláin, Seán** (1900–), novelist and biographer, b. Dublin. Educ. at the National Univ. of Ireland and Harvard, he took the Republican side in the civil conflict of 1922, and was director of publicity for the Irish Republican Army. From 1930 to 1933 he was a lecturer at St Mary's Training College, Strawberry Hill, Middx. and then returned to co. Wicklow. His first book, a collection of short stories entitled *Midsummer Night's Madness*, appeared in 1932. His novels include *A Nest of Simple Folk*, 1933, *Bird Alone*, 1936, *A Purse of Coppers*, 1937, *Come Back to Erin*, 1940, and *Teresa*, 1946. Of his biographies the best is *King of the Beggars: a Life of Daniel O'Connell*, 1938; he also wrote lives of de Valera, 1933, and Constance Markievicz, 1934. He ed. the works of Thomas Moore, 1929, and the autobiography of Wolfe Tone, 1937. *She Had to do Something*, 1938, is a play, and *A Summer in Italy*, 1950, and *South to Sicily*, 1953, are travel books.

**Offa** (fl. 757–96), King of Mercia. He succeeded Ethelbald, and by the time he d. had re-established Mercian supremacy in S. England, the King of Wessex being his dependant, and his influence extending into Northumbria. From 784 to 796 O. had numerous contacts with Europe,

negotiating as an equal with Charlemagne. O. secured the estab. of a third Eng. archbishopric, at Lichfield (787), in an effort to consolidate Mercian ascendancy, even in the eccles. field. See also OFFA'S DYKE.

**Offaly**, inland co., prov. of Leinster, Rep. of Ireland; bounded W. by the R. Shannon. The surface on the whole is flat, the N. part being occupied by the Bog of Allen, but the Slieve Bloom Mts lie along the border between King's Co. and Queen's Co., the greatest altitude being 1732 ft. The soil is not very fertile, being either deep bog or gravelly loam, but

but left and played the cello in the orchestra of the Opéra-Comique. In 1847 he became conductor at the Théâtre Français. After 2 early attempts he produced the operetta *Pépito* in 1852, and during a quarter of a cent. he turned out about 100 light stage pieces. In 1855 he took over the management of the Théâtre Comte and renamed it the Bouffes-Parisiens. This lasted until 1861, whereafter he had no theatre of his own until 1873, when he managed the Théâtre de la Gaîté until 1875. He went to the U.S.A. until 1877, but returned to Paris, where alone he found that his success was



By permission of the National Museum of Wales

OFFA'S DYKE, HERGAN, SHROPSHIRE, FROM THE WEST

there are some rich pastures near the Slieve Bloom Mts. and grazing dists. on the borders of Westmeath, which are chiefly used for sheep. Oats, barley, rye, potatoes, and turnips are grown, and cattle, sheep, pigs, and poultry bred. The chief tns are Tullamore (co. tn, pop. 6200) and Birr. Area 771 sq. m.; pop. 52,000.

**Offa's Dyke**, great earthwork made about AD 785 between the Dee and Severn by Offa (q.v.) of Mercia as a boundary between the English and the Welsh. It is laid out and constructed with exceptional engineering skill to take every advantage of natural features of the land. It consists of a large rampart and a ditch, the latter normally on the Welsh side.

**Offenbach**, Jacques (real name Jakob Levy Eberst) (1819-80), Ger.-Fr. composer, b. Offenbach-on-Main. His father was cantor at the synagogue of Cologne. O. was sent to Paris early in his youth, studying at the Conservatoire in 1833-4,

permanent. His only large-scale opera, *Les Contes d'Hoffmann*, occupied him for many years, but he left it not quite finished at his death, and it was revised and partly scored by Guiraud. He has been styled the creator of *opéra-bouffe*. His operettas include *Ba-ta-clan*, 1855, *Orphée aux enfers*, 1858 (revised 1874), *Geneviève de Brabant*, 1859 (revised 1875), *Chanson de Fortunio*, 1861, *La Belle Hélène*, 1864, *Barbe bleue*, 1866, *La Vie Parisienne*, 1866, *La Grande Duchesse de Gérolstein*, 1867, *Robinson Crusoe* (after Defoe), 1867, *La Périochole*, 1868, *L'Île de Tulipatan*, 1868, *La Princesse de Trébizonde*, 1869, *Vert-Vert*, 1869, *La Jolie Parfumeuse*, 1873, *Dick Whittington and his Cat* (London), 1874, *Le Voyage dans la lune* (after Verne), 1875, *Le Docteur Ox* (after Verne), 1877, *La Foire de Saint-Laurent*, 1877, *Madame Favart*, 1878, *La Fille du tambour-major*, 1879. *Les Contes d'Hoffmann* was produced after his death in 1881. Another opera, *The Goldsmith of Toledo* (after Hoffmann) (produced in

1919) is a pasticcio from sev. operettas. See J. Brindejont-Offenbach, *Offenbach mon grand-père*, 1940; L. MacClintock (trans.), *Orpheus in America*, 1958.

**Offenbach**, Ger. tn in the *Land* of Hessen (q.v.), on the Main (q.v.), 5 m. E. of Frankfurt. Its commercial prosperity is largely due to the settlement in the tn of Huguenots (q.v.) in the 17th cent. There are leather (leather museum), chemical, and engineering industries. Pop. 102,100.

**Offenburg**, Ger. tn in the *Land* of Baden-Württemberg (q.v.), on the Kinzig, 9 m. from its junction with the Rhine, 60 m. WSW. of Stuttgart. It has an ancient church and castle, and is the centre of a fruit and wine producing dist. Pop. 27,000.

**Offences**, see CRIMINAL LAW.

**Offensive Trades**. This expression as used in the Public Health Act, 1875, denotes certain specified trades, namely, those of a blood boiler, bone boiler, fell-monger, soap boiler, tallow melter, or tripe boiler, and also any other noxious or offensive trade, business, or manuf. In dists. to which Section 51 of the Act applies O. T. will include any trade, business, or manuf. which the local authority declares by order confirmed by the ministry to be an offensive trade. To establish (see below) an offensive trade in an urb. dist. without the written consent of the dist. council renders the offender liable to a penalty of £50, and a daily penalty is incurred by those who continue without such consent to carry on an offensive trade estab. since 1875. Estab., in this context, was the subject of legislation in 1925. The Public Health Act of that year made special provision to meet the case of trades estab. after being declared O. T. With the object of abating nuisances from O. T., the Public Health Act, 1875, provides that if the medical officer of health or any 10 inhab. of a dist. or 2 legally qualified medical practitioners certify to the urb. dist. council that any melting-place, soap-house, slaughter-house, etc., is a nuisance, and dangerous to the health of the inhab., the council must proceed summarily against the owner or occupier (or even the foreman or other employee) for penalties; which penalties, on subsequent conviction, may be increased to £200. An action may also be brought in the high court for nuisance (q.v.). Local authorities also have statutory powers for regulating alkali and chemical works.

**Offertory** (Lat. *offertorium*, an oblation): 1. The presentation of the unconsecrated bread and wine at the altar during the Eucharist or Mass. In the Oriental and Sarum rites it was made with great ceremony and a procession.

2. Anthem recited or sung, and the prayer made at the O.

3. Sometimes, though erroneously, the alms collected at that time.

**Office**, Holy, or more completely the **Congregation of the Holy Office of the Inquisition**, forms a dept. of the Rom. curia for the examination of books and the trial of eccles. offences. See INQUISITION.

**Office Management**, function of organising and managing clerical work in the

most efficient, constructive, and economical way consistent with good human relations with the labour involved and with the aims and objects of the businesses or gov. depts concerned, and in compliance with the legal requirements of the Companies Acts.

Careful selection is necessary for each office job, fair salary rates should be fixed, known opportunities for promotion should be open to all, and good working and welfare conditions are of first importance. From the point of view of the work to be carried out the manager must devise suitable routines and systems which will enable it to be dealt with in the most speedy and efficient manner, e.g. for gathering, collating, and recording data, whether of a financial or statistical nature or of other kinds. Correspondence both with other organisations and the public and with other depts of the same organisation must be dealt with, either as part of a routine or, if its importance requires, with individual attention. Outgoing mail must be prepared for posting and incoming mail opened, sorted, and distributed.

In order to deal with all the work efficiently the office manager should have a good knowledge of office and accounting machinery, of which the most important are the typewriter (q.v.), duplicator, and the addressing machine; also the various accounting machines, such as posting, adding, and calculating machines (q.v.). It is the function of the office manager to co-ordinate work, staff, and machinery into an organisation which operates smoothly and performs the work required of it as efficiently as possible. From this it will be apparent that the principle of div. of labour is resorted to in the modern office. Clerical routines are broken down into their component parts, and repetitive operations are grouped together.

While the function of O. M. can be readily understood it is not always clear which executive within an organisation is responsible for it. In the case of the very small organisation the managing director or principal is himself responsible for O. M. along with all the other activities of the business; as the business grows he appoints assistants, and the O. M. often becomes the part-time responsibility of someone who has other functions to perform. It is only when a business employs a large number of clerical staff that O. M. takes on a separate identity. The office is then split up into a number of separate and somewhat independent functions, such as accountancy, sales (both home and export), purchasing, and so on, according to the nature of the business. There is usually an executive responsible for each of these special functions and each has a number of staff attached to him to assist in the clerical routine. With the advances that have been made in the mechanisation of clerical work, particularly with the introduction of electronic computation (q.v.), enlightened organisations realise that it is necessary to have someone specialising in the art of executing clerical work in the most efficient

manner for all sections of the office, who must also have knowledge and experience of human behaviour in order that the staff employed will be suitable for the changing nature of the work which may be assigned to them. It is not uncommon for the overall responsibility for O. M. to be vested in either the company secretary or the accountant.

The advantage of having a specialist responsible for the management of the office routine of all sections is that the other specialist managers can devote their whole time and energies to the functions for which they are responsible. A separate manager responsible for the routine clerical work and staff in the various specialised sections of the office does, however, raise the question of split loyalties, but where difficulties arise it is now common practice in the large organisations to have an Organisation and Methods Dept which studies office methods, mechanisation, and procedures, for the purpose of advising the specialist managers on their office problems, leaving with them the full responsibility for the control of the work of the clerical staff attached to them.

The Office Management Association offers company secretaries and office managers opportunities of meeting together to discuss their office problems, and an education scheme is now available whereby a course of studies can be undertaken for a diploma in O. M. Anyone possessing this diploma is well qualified to accept responsibilities of the management of any commercial or industrial office, or to join an Organisation and Methods Dept team. See G. Mills and O. Standingford, *Office Organisation and Method*, 1950; H. C. Wylie and R. P. Brecht, *Office Organization and Management*, 3rd ed., 1953; and the journals, *Business and Office Management* (monthly).

**Officer, British.** This term when it stands alone is always held to refer to an O. holding the sovereign's commission. The navy, army, and air force lists contain the names of all O.s currently serving, but the status of O. holds good even after retirement from the active list. O.s whilst on full pay are forbidden to hold any municipal office, exempted from jury service, either coroner's, grand, or common juries, and may not become directors of any company. Special permission must be granted before an O. on the active list can leave the country. Although any O. can be dismissed at the sovereign's pleasure, nevertheless it is only after trial by a general court martial that an O. can be punished. See also ARMY; BRITISH ARMY, *British Army Pay*; RANK (IN THE ARMY).

**Officers' Mess, see MESS.**

**Officers' Training Corps, see COMBINED CADET FORCE.**

**Official List, see STOCK EXCHANGE.**

**Official Receiver, or Liquidator, see BANKRUPTCY; COMPANY AND COMPANY LAW; RECEIVER.**

**Official Secrets.** The Official Secrets Act, 1911 (which repeals and re-enacts with amendments the Act of 1889), makes

it a felony punishable with penal servitude to approach or enter any 'prohibited place' for any purpose prejudicial to the safety or interests of the State; to make any sketch, plan, model, or note calculated to be useful to an enemy; or to obtain or communicate to any other person any information which might be or which is intended to be useful to an enemy. It is not necessary to show that the offender was guilty of any particular act tending to show a purpose prejudicial to the State, and he may be convicted if, from his conduct or known character, it appears that his purpose was prejudicial to state interests. The Act also provides that any person who communicates to any unauthorised person information that has been entrusted to him in confidence by any person holding office under the Crown is guilty of a misdemeanour. The repealed Act of 1889 was passed after a Foreign Office official had disclosed a confidential diplomatic document. The law was strengthened in 1911, following a proposal by the Committee of Imperial Defence. The law was further strengthened by an Act of 1920 which makes it a misdemeanour to do certain things, either in order to gain admission into a prohibited place or for any purpose prejudicial to the safety or interests of the State. These acts include the unauthorised use of a naval, military, air force, or police uniform or one which resembles an official uniform; forging or tampering with passports or military or naval passes or permits; personating some office-holder or person to whom an official code or pass has been issued, or being in unlawful possession of any die, seal, or stamp belonging to a gov. dept. or a die, etc., so resembling an official die as to be calculated to deceive; or retaining an official document without authority to retain it; or allowing any other person to have possession of an official document issued for the use of the accused alone; or communicating a secret official code word or password; or being in unlawful possession of any such code or password. The fact that a person has been in communication with or attempted to communicate with a foreign agent, whether in Great Britain or abroad, is evidence that he has, to the prejudice of the safety and interests of the State, obtained or tried to obtain information which is calculated or intended to be useful to an enemy, and this evidence may be adduced in proceedings under Section 1 (Spying) of the prin. Act (1911). The secretary of state has power to compel, by warrant, the production of telegrams from any person who owns or controls any telegraphic cable or wireless business, when it is expedient in the public interest to compel production; and any person who carries on the business of receiving postal packets must be registered and is subject to regulations which require him to keep books giving the names and addresses of persons for whom packets are received and any instructions received as to the delivery. The Act also gives to chief officers and superintendents of police and others somewhat exceptional

powers of interrogation in cases under the Act.

**Offset Printing,** see LITHOGRAPHY.

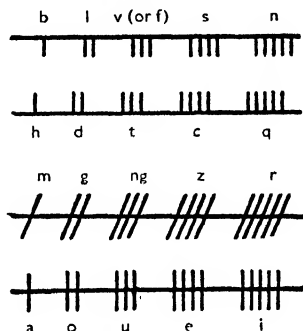
**O'Flaherty, Liam** (1897- ), novelist, b. on the Aran Is. off the coast of Galway. Intended for the priesthood, he went to Rom. Catholic schools at Rockwell and Blackrock and to the National Univ., Dublin. During the First World War he enlisted in the Irish Guards and fought in Belgium, but was invalided out in 1917. For the next few years he roamed all over the world, working variously as deck-hand, porter, clerk, and labourer. In the civil conflict of 1922 he fought for the Irish Republicans. His first novel, *Thy Neighbour's Wife*, appeared 2 years later, and was followed in 1926 by *The Informer*, which won the Tait Black Memorial Prize. Later novels are *Mr Gilhooley*, 1926, *The Assassin*, 1928, *The House of Gold*, 1929, *The Puritan*, 1931, *The Martyr*, 1933, *Famine*, 1937, and *Insurrection*, 1950. A master of the short story, in which he is more poetical and less violent than in the novel, he pub. many collections, including *Spring Sowing*, 1926, *The Tent*, 1926, *The Fairy Goose*, 1929, *The Mountain Tavern*, 1929, and *The Wild Swan*, 1932. He also wrote a life of Tim Healy, 1927, and a guide to Ireland, 1929. *Darkness*, 1926, is a tragedy, and *Two Years*, 1930, and *Shame the Devil*, 1934, are autobiographical.

**Offerdingen, Heinrich von** (c. 1170-1250), famous minnesinger (q.v.).

**Ogam, or Ogham.** This term, spelt in Old Irish *Ogom* or *Ogum*, of uncertain origin and meaning, has been applied to a peculiar form of cryptic or anct language, and more especially to a curious script, employed by the Celtic pop. of the Brit. Isles. Of the nearly 400 inscriptions still preserved, over 260 were found in the S. co.s of Ireland (mainly in Kerry and Cork), 55 in the rest of Ireland, about 40 in Wales, 1 in Cornwall, 2 in Devon, 1 in Hants (at Silchester, marking the E. limit of their distribution), about 10 on the Isle of Man, and about 25 in Scotland. There are sev. stones with O. inscriptions in the National Museum, Dublin, and in the Brit. Museum, of which that from Llywel, Brecon, bearing the name 'Macutrenas' is the best known. The great majority of these inscriptions belong to the 6th cent. AD, but some belong to the 5th and some to the 7th cent. The inscriptions found in Ireland are, with one exception, written in O. alone (in Celtic) while the inscriptions found in Wales are usually bilingual (Lat.-Celtic) and written in Rom. characters and O. script. A Runic-O. inscription was found on the Isle of Man. The inscriptions found in N.E. Scotland and in the N. Isles, chiefly on the Shetlands, are written in a variety known as 'Pictish Oghams'; they are assigned to the anct Picts, who according to some scholars spoke a non-Celtic and non-Indo-European language, and according to others were early Celts.

The O. inscriptions contain very little besides proper names, but these are of great value for the light they throw upon the early Celtic tongue. Indeed, in

orthography and the inflection of nouns, these inscriptions reveal a stage of the Celtic idiom much earlier than that of the earliest preserved MS. literature, which, partly belonging to the 6th cent. AD, is contemporary with them. The O., for instance, still makes use of letters *g, v, ng*, unknown to the MSS.; the anct inscriptions supply us with *magvi*, the genitive of the word which has yielded the term *mac*, 'son.' The direction of writing was either vertical (upwards) or horizontal. In vertical inscriptions, those begin at the bottom left-hand corner, proceed up the left-hand edge, then over the top and down on the right-hand edge.



THE OGAM MAIN CHARACTERS

The main O. alphabet consisted of 20 letters, divided into 4 groups or *aicmes*, and represented by strokes, from 1 to 5 in number, arranged in various positions about a central stem-line. The place of this chief line was sometimes filled by the edge or arris of the object (usually stone or other squared hard material), on which the letters were cut. The 'letters' of the first *aicme* (*b, l, v* or *f, s, n*) were placed under the line (assuming this to be horizontal); the second *aicme* (*h, d, t, c, q*) above it; the third *aicme* (*m, g, ng, z, r*), diagonally through it; and the fourth *aicme* (*a, o, u, e, i*) intersecting it at right angles, or by notches. There were 5 other characters *forfeda*, which were a little more complicated. They are generally interpreted as diphthongs (*ea* or *eo*, *oi*, *ia* or *io*, *ui*, and *ae*), which according to some scholars have often a consonantal value in the inscriptions (a kind of guttural *k, p, z*, etc.).

This alphabet was the basic O. script. There were sev. secondary varieties, such as the 'bird O.' (*En-O.*), 'herb O.' (*Lus-O.*), 'colour O.' (*Dath-O.*), 'church O.' (*Cell-O.*), 'pig O.' (*Muc-O.*), 'son O.' (*Mac-O.*), and many others.

The use of the cryptic O. scripts continued until the Middle Ages, and the late 14th- (or 15th-) cent. *Book of Ballymore* (ed. by R. Atkinson, 1887; see also Calder's ed. of *Auracept na n-Eces*, the *Scholars' Primer*, 1917) reproduces the earliest keys

for transliteration. See J. Rhys, *Lectures on Welsh Philology*, 1879; J. MacNeill, 'The Irish Ogham Inscriptions,' in *Proceedings of the Royal Irish Academy*, 1909, *Celtic Ireland*, 1921, and *Archaisms in the Ogham Inscriptions*, 1931; R. A. S. Macalister, *Studies in Irish Epigraphy* (3 vols.), 1897-1907, *The Secret Languages of Ireland*, 1937, and *Corpus Inscriptionum Insularum Celticarum*, I, 1945; W. Keller, *Die Entstehung des Ogom* ('Beiträge,' etc.), 1938; E. MacNeill, 'The Language of the Picts,' in *Yorkshire Celtic Studies*, 1940; J. Vendryes, 'L'Écriture ogamique et ses origines,' in *Études Celtiques*, 1941; D. Diringer, *The Alphabet* (4th impression), 1953.

**Ogasawara Jima**, see BONIN ISLANDS.

**Ogden, Charles Kay** (1889-1957), linguist; educ. Cambridge, director of the Orthological Institute. In 1926, with I. A. Richards of Harvard, he began research on Basic English (q.v.), on which he has pub. sev. works. Other pub. include: with I. A. Richards and J. Wood, *The Foundations of Aesthetics*, 1922, *Bentham's Theory of Fictions*, 1932; with I. A. Richards, *The Meaning of Meaning*, 1944, and *The ABC of Psychology*, 1944.

**Ogden**, city of Utah, U.S.A., co. seat of Weber co., on the Weber 32 m. N. of Salt Lake City. The second largest city in the state, it is an intermountain railroad junction and an industrial and distribution centre for an irrigated agric. area. It ships livestock and has meat-packing plants and canneries. It produces beet-sugar and manufa. clothing and iron castings. It is the seat of Weber junior college. Pop. 57,112.

**Ogdensburg**, city and riv. port of New York, U.S.A., in St Lawrence co., on the St Lawrence R. It manufs. paper, wood, and metal products, paint, mattresses, clothing, and flour. Remington Art Memorial, with works of Frederic Remington, is here. Pop. 16,166.

**Ogee**, moulding formed by 2 curves, the upper concave and the lower convex. In France the ribs which in Gothic vaulting cross the vault diagonally are known as ogive ribs, and the adjective is also frequently applied to any pointed arch.

**Ogerius, Oggero, or Oggieri**, see OGIER.

**Oggione, Oggionno, or Uggione, Marco da** (c. 1470-1549), It. painter, b. Oggiono. He studied under Leonardo da Vinci, and made sev. copies of his 'The Last Supper,' one of which is in the Royal Academy. He also executed frescoes for the church of S. Maria della Pace at Milan, the 2 best being 'The Marriage at Cana' and 'The Assumption,' both of which are now in the Brera.

**Ogier le Danois** (It. **Uggero, Oggero, Oggieri**; Lat. **Ogerius**), hero of an anct Fr. romance whose story is probably a contribution from the store of Norman tradition. Holger, or Olger, Danske being the national hero of Denmark. He figures in Ariosto's *Orlando Furioso* and other romantic tales and poems. Some authorities say that his surname was bestowed on him because he came from Denmark, others that he took it after having conquered that country, while yet

others say that O. was a Saracen who turned Christian, and as the Fr. barons called him in jest O. *Damné* he himself insisted on being so called when he was christened. This surname agrees with the assertion that he was condemned by Charlemagne. He has been identified with the Helgi of the Edda and also with the Frankish warrior, Ottokar (or Autchar). See C. Voretzsch, *Über die Sage von Ogier dem Dänen*, 1891; P. Paris, *Recherches sur Ogier le Danois*, Bibliothèque de l'École des Chartes.

**Ogilby, John** (1600-76), poet and translator, b. near Edinburgh. He accompanied Strafford to Ireland and was made deputy master of the revels, but his fortunes being ruined by the Civil war, he returned to England. Having learned Latin he trans. Virgil into Eng. verse in 1654, and being successful in this attempt turned his attention to Greek and pub. trans. of Homer's *Iliad*, 1660, and *Odyssey*, 1665. Others of his works are *The Fables of Aesop Paraphrased*, 1665, and *Road Books of England and Wales*, 1675. He was entrusted with the 'poetical part' of Charles II's coronation in 1661.

**Ogilvie, Sir Frederick Wolff** (1893-1949), scholar and administrator, b. Valparaiso, and educ. at Balliol College, Oxford. Until 1934 he was prof. of political economy at Edinburgh Univ., when he became president and vice-chancellor of Queen's Univ., Belfast. In addition to membership of sev. councils and committees O. was director-general of the B.B.C. from 1938 to 1942, his term of office being marked by the inception of the forces programme and the expansion of the overseas service. Knighted in 1942, he became principal of Jesus College, Oxford, in 1944.

**Ogilvie, John** (1707-1867), lexicographer, b. Ranfshire. In 1824 he entered Aberdeen Univ., and in 1831 was appointed mathematical master in Gordon's Hospital. He compiled the *Imperial Dictionary*, 1850 (supplement, 1855), *Comprehensive English Dictionary*, 1863, and the *Students' English Dictionary*, 1865.

**Oglethorpe, James Edward** (1696-1785), Eng. general and philanthropist, the founder of the state of Georgia, b. London. He served under Prince Eugene, and distinguished himself in the campaign against the Turks, 1716-17. In 1722 he became M.P. for Haslemere, and in 1729 was chairman of the parl. committee on debtors' prisons. In 1732 he obtained a charter for settling the colony of Georgia in America as a refuge for paupers and a barrier for Brit. colonies against Sp. aggression. He wrote *A New and accurate account of the provinces of South Carolina, Georgia, etc.*, 1733, and *An Important account of the late expedition against St Augustine*, 1742. Returning to England in 1743, he took part against the Jacobite insurrection of 1745 but was accused of failing in his military duties, and although acquitted he resigned his commission. He was a friend of Dr Johnson, Boswell, Goldsmith, Burke, and Walpole.

**Oglio**, see Po.



**Ogmore and Garw**, urb. dist. and tn of S. Wales, in Glamorgan, 4 m. SW. of Bridgend. Coal is extensively mined. Pop. of dist. 22,631.

**Ogowe**, riv. of W. Africa, in Fr. Equatorial Africa, rising in lat. 3° S., a little to the S. of Ngango. Its direction is N. to W., and then SW., receiving sev. tribs. on both sides, including the Lolo and the Ivindo. It enters the Atlantic by a delta after a course of 750 m.

**O'Grady, Standish James** (1846-1928), historian and novelist, b. Castletown Berehaven, where his father was Protestant rector. Educ. at Tipperary Grammar School and Trinity College, Dublin, where he graduated in 1868, he was called to the Bar, but soon gave up the law. He is best known for his *History of Ireland: Heroic Period*, 1878, which kindled interest in the legendary material used later by writers of the Irish Renaissance. Among his books of historical romance are *The Bog of Stara*, 1893, *In the Wake of King James*, 1896, *The Flight of the Eagle*, 1897, *In the Gates of the North*, 1901, 1921, and *Finu and his Companions*, 1921. He also ed. Sir Thomas Stafford's *Pacata Hibernia*, 1896. He owned and ed. the *Kilkenny Moderator* and the *All-Ireland Review*.

**Ogulín**, tn in Croatia, Yugoslavia, on the underground riv. Dobra. It is a centre for the timber and agric. produce of the heavily forested region Gorski Kotar. Pop. 12,500.

**Ogyes**, or **Ogyus**, son of Bocotus and one of the Bocotian aborigines. He was King of the Ilectenes, the oldest inhab. of Boeotia, which was visited during his reign by an inundation of Lake Copafs. This flood is usually called after him the Ogygian.

**O'Higgins, Bernardo** (1778-1842), Chilean patriot, soldier, and statesman, generally known as the Liberator of Chile, natural son of Ambrosio O'H., also an administrator and soldier, of Irish birth. He led the Chilean patriot forces against the Sp. royalists (1810), and was made commander of the patriot army (1813) in succession to Juan José Carrera, who had been made general-in-chief in 1811. Carrera's republican troops twice defeated the royalist forces, but were themselves defeated in 1813. The following year O'H., with Carrera, was also defeated, at Rancagua, and both leaders fled the country. They received the support of Buenos Aires, levied an army in La Plata, and marched against the royalists, whom they completely defeated at Chacabuco (1817), and O'H. became dictator of Chile. The republicans were, however, severely defeated at Cancha Rayada, but this defeat was soon followed by the final defeat of the Spaniards at Maipú, the victory which sealed the independence of Chile. O'H.'s progressive administration was ended after a few years by a popular revolt in 1823, and he retired to Peru. See E. Orrego Vicuña, *Iconografía de O'Higgins*, 1937, and J. Eyzaguirre, *O'Higgins*, 1945.

**O'Higgins, Kevin Christopher** (1892-1927), Irish politician, b. Stradbally. He was educ. at Clongowes, at St Patrick's

College, Carlow, and at the National Univ. of Ireland. He was articled to his uncle, Maurice Healy, a solicitor, but did not serve out his time. He joined Sinn Féin (q.v.), and took part in the 'Easter Rising' in Dublin in 1916; whilst in prison as a result, he was elected M.P. for Queen's Co. In Cosgrave's (q.v.) gov. of 1922 he was minister for justice and vice-president of the executive council; he estab. the civic guard and put down disorder firmly. In June 1927 he became minister for external affairs also; in the following month he was assassinated near Bootstown on his way to Mass. Some consider O'H. to have been the most able figure in Irish public life. See life by T. de Vere White, 1948.

**O'Higgins**, prov. of central Chile, takes its name from Bernardo O'H. (q.v.). Colchagua lies to the S. and Santiago to the N. The Andes traverse the E. portion. Gold and copper (at El Teniente) are mined, cattle reared, and wine, fruit, and wheat are produced. Itancagua is the cap. Area 2745 sq. m.; pop. 224,637.

**Ohio**: 1. One of the United States of America, known as the Buckeye state, bounded N. by Michigan and Lake Erie, E. by Pennsylvania and W. Virginia, S. by W. Virginia and Kentucky, W. by Indiana. It is separated from W. Virginia and Kentucky by the O. Riv., which forms its boundary for 436 m. Its Lake Erie shore is 230 m. O. has no considerable elevations, being highest in the centre and sloping thence to the lakes in the N. and to the O. Riv. in the S. It is drained by numerous rivs., among which the Great and Little Miami, Scioto, and Muskingum are affluents of the O. Riv., and the Maumee, Sandusky, Huron, Vermilion, Cuyahoga, and Ashtabula empty into Lake Erie. The coal-beds of E. O. are of great extent, and there are abundant deposits of limestone. This has led to enormous expansion of iron and steel industries, and, as a consequence, the building of great machine-making plants and automobile factories. The state ranks first in the manuf. of machinery and fabricated metal products. Cleveland, Canton, Youngstown, Middletown, and Steubenville are the great steel and iron centres. Akron manufs. automobile tyres and other rubber products. The output of automobiles in Toledo and Cleveland is second only to that of Detroit. Coal, stone, cement, lime, sand and gravel, and clays are also produced, as well as bricks, tiles, clothing, furniture, spirits, and woollen and cotton goods. The soil is rich everywhere; the climate is temperate, with a liability to a cold in winter reaching sometimes below zero. The natural forests are rich in oak, black walnut, maple, etc. Cattle-breeding and dairy farming are important industries. The chief agric. products are Indian corn or maize (169,584,000 bushels in 1950), hogs, milk, cattle, wheat, eggs, hay, and soybeans. A large commerce is carried on by the O. Riv. and Lake Erie. In 1955 there were 232 airports. Railway mileage is 8400. The state is organised in 88 cos. The legislature consists of a House of

Representatives of 135 members and a Senate of 33 members, both houses being elected for 2 years. Two senators and 23 representatives are sent to Congress. The chief towns are Cleveland, 914,800; Cincinnati, 504,000; Columbus (cap.), 375,900; Toledo, 303,800; Akron, 274,600; Dayton, 243,900; Youngstown, 168,300; Canton, 116,900; Springfield, 78,500; Lakewood, 68,000; Cleveland Heights, 59,100; Hamilton, 58,000; 12.5 per cent of O.'s pop. are foreign-born, and there are great numbers of Ger. ancestry. Among the institutions of higher learning are O. State Univ. at Columbus with 20,500 students; W. Reserve Univ. at Cleveland, 8500; univ. of Cincinnati, 13,500. O. has superseded Virginia as the mother of presidents. Five men b. in O. were elected as presidents while still O. men. Two others elected as presidents of the state were b. in O. The prehistoric Mound-Builders left many remains in O., the most impressive being Serpent Mound, 1300 ft. long, in Adams co. O. was first settled in 1788 and was organised and admitted as a state in 1803. Area 41,122 sq. m.; pop. 7,950,000. See J. W. Taylor, *History of State of Ohio*, 1854; W. C. Howells, *Recollections of Life in Ohio*, 1895; E. O. Randall and D. J. Ryan, *History of Ohio* (5 vols.), 1913; E. F. Roseboom and F. P. Weisenburger, *A History of Ohio*, 1934; Federal Writers' Project, *The Ohio Guide*, 1940; C. F. Wittke (ed.), *History of the State of Ohio* (6 vols.), 1941-4.

2. Riv. of U.S.A., second largest affluent of the Mississippi, formed by the union of the Allegheny and Monongahela at the W. foot of the Alleghenies, at Pittsburgh, Pennsylvania. It flows WSW. for 980 m., with a breadth of 1200 to 4000 ft. and with its tribs. drains an area of 203,900 sq. m. In its course it separates the states of O., Indiana, and Illinois from the states of W. Virginia and Kentucky. The prin. towns upon its banks are Pittsburgh, Cincinnati, Louisville (where there are falls), Wheeling, Huntington, Covington, Steubenville, and Evansville. It is navigable from Wheeling, 100 m. below Pittsburgh. The O. valley is a centre of rapidly expanding industry and the channel of a vast commerce by towboat and barge, which it shares with its chief branches, including the Tennessee, Cumberland, Wabash, and Green. See R. E. Banta, *The Ohio*, 1951.

Ohlau, see OLAWA.

Ohlenschläger, see OEHLenschLÄGER.

Ohm, Georg Simon (1787-1854), Ger. physicist, b. Erlangen, became prof. of experimental physics at Munich Univ. in 1852. He announced his law of the theory of the voltaic current in 1825, and pub. *The Galvanic Circuit worked out Mathematically* in 1827. This work exercised an important influence on developments in electricity. In 1841 the Royal Society awarded him the Copley medal. See life by W. Gerlach, 1939.

Ohm, see OHM'S LAW and UNITS, ELECTRICAL.

Ohmmeter, portable instrument for measuring electrical resistance used largely for testing insulation resistance of installations. See ELECTRIC METERS.

Ohm's Law states that for a given electrical conductor at constant temp. the ratio between the voltage across the ends and the current in the conductor is constant. The ratio is the *resistance*,  $R$ , of the conductor. Further, if the cross-section area  $S$  is uniform, the resistance is proportional to the length  $l$  and inversely proportional to  $S$ , and it depends also on the material. Thus  $R = \rho l/S$  where  $\rho$  is the *resistivity* of the material. The resistance is measured in ohms: if 1 V. across the ends of a wire gives a current of 1 A., the resistance is 1 ohm. The resistivity (or specific resistance)  $\rho = RS/l$  is measured in ohm cm. In most conductors  $\rho$  increases with temp. (See CURRENT ELECTRICITY and UNITS, ELECTRICAL.)

Ohnet, Georges (1848-1918), Fr. author, b. Paris; educ. at the Lycée Bonaparte. After 1871 he was editor successively of *Le Pays* and *Constitutionnel*. In collaboration with Denayrouze O. wrote his play *Regina Sarpi*, 1875. *Serge Panine* appeared as a novel in 1881, and was crowned by the Academy. *Le Maître de forges*, a novel afterwards famous as a play, appeared in 1882. O. was popular with lovers of romance. Later novels include *Dette de Haine*, 1891, *La Femme en gris*, 1895, and *Le Crépuscule*, 1902.

Ohonamochi, Onamuchi, or Okuni-Nushi, Jap. earth-god, sometimes identified with Daikoku, god of wealth. His great shrine at Kitzuki, in Idzumo, was the second in importance in Japan. He was son of Susanoo, god of the underworld, and resigned his throne in favour of the present emperor's ancestors.

Ohře (Ger. Eger), riv. of Germany and Czechoslovakia, which rises in the Fichtelgebirge (q.v.) and flows NE. through Cheb (q.v.) and Karlovy Vary (q.v.) to join the Labe (see ELBE) 30 m. NW. of Prague. Length 190 m.

Ohrid (Okhrida; Orid; Gk *Lahnidos*), tn in Macedonia, Yugoslavia, near the Albanian border. It is on the beautiful mt lake of O. O. is on the site of a Gk colony, and is said to be the oldest tn in Yugoslavia. It has many medieval buildings, including a 10th-cent. fortress and an 11th-cent. church. Cyril and Methodius (qq.v.), the creators of the Slav alphabet, are believed to have worked here. Pop. 11,000.

Ohich, Loch, lake (4 m. long and  $\frac{1}{2}$  m. broad, with a depth of 150 ft) of Inverness-shire, Scotland, drained by the Riv. O. into Loch Ness at Fort Augustus. It forms part of the Caledonian Canal, and is famous for its trout and salmon fisheries.

Oidium, name given to the conidial form of various ascomycetous fungi (Erysiphaceae) which give rise to what are popularly known as mildews and moulds. In this stage the white cobweb-like mycelia produce simple conidiophores, from which the conidia quickly germinate and grow in chains, covering the host as with a mealy powder. The life-cycle is completed in the autumn, when ascocarps, or perithecia, arise as small black points on the mycelium and produce spores which usually remain dormant

through the winter and germinate in the following spring. In cases where the life-cycle is known the fungus is placed in its proper genus, but where the ascocarps are still undiscovered, the use of the term generically is still adopted. See MILDEW and MOULD.

**Oil**, see OILS AND FATS; OIL WELLS; PETROLEUM.

**Oil and Petrol Engines**, see DIESEL ENGINE; INTERNAL COMBUSTION ENGINE; MOTOR BOATS; MOTOR CARS; MOTOR CYCLES; MOTOR SHIPS.

**Oil-beetle**, name given to any species of *Meloe*, a genus of Cantharidae (q.v.), on account of the oil-like matter which it exudes.

**Oil-bird**, see GUACHARO.

**Oil City**, city of Pennsylvania, U.S.A., in Venango co., at the mouth of the Oil Creek, at its junction with the Allegheny R., 52 m. S.E. of Erie. It is one of the chief oil centres in the state. The city has been 3 times partially destroyed by flood and fire. Pop. 19,300.

**Oil-drop Experiment**, well-known experiment performed in 1909 by R. A. Millikan (q.v.) to determine the charge ( $e$ ) of an electron (q.v.) and allowing a direct demonstration of the fact that all electric charges are integral multiples of the electronic charge. The principle of the experiment lies in the balancing of the force due to gravity acting on a charged oil-drop with the force due to an applied electric field ( $E$ ) acting on the same drop in the opposite direction. For a drop of mass  $m$  gm. carrying a charge  $ne$ , where  $n$  is an integer, the force due to gravity is  $mg$  dynes ( $g$  is the acceleration due to gravity), and the electric force is  $neE$ . When the drop is held stationary  $mg = neE$ , and to find  $ne$  it is necessary to know  $m$ . This is found indirectly by determining the radius  $r$  of the drop from measurements of the rate of fall ( $v$ ) under gravity in the absence of an electric field, for which Stokes Law gives

$$mg = 6 \pi \eta r v (1 + b/pr)$$

where  $\eta$  is the coefficient of viscosity,  $p$  is the pressure, and  $b$  is an empirically derived constant. Various modifications and refinements of this method were made, in particular a redetermination of the viscosity of air was necessary to produce agreement between the values of  $e$  found by Millikan and that found from X-ray methods (q.v.). The accepted value of  $e$  is  $4.803 \times 10^{-10}$  electrostatic units of charge. The apparatus consists of 2 parallel plates between which an electric field is applied of sev. hundred volts per cm. Drops of oil of diameters about  $10^{-4}$  cm. are produced by a fine spray and allowed to enter the space between the plates by way of a small hole in the upper plate. Friction during the spraying process charges the drops. Bright indirect illumination allows the movements of the drops to be observed by a low-power telescope with a graduated eyepiece. Draughts are carefully excluded, but nevertheless the drops wander considerably owing to Brownian Movement (q.v.). See also ELECTRON. See

R. A. Millikan, *Electrons (+ and -), Protons, Photons, Neutrons, and Cosmic Rays*, 1935.

**Oil-fish** (*Ruvettus*), genus of spiny-finned fishes of the family Gempylidae, which grow to a length of about 6 ft. The common O., *R. pretiosus*, is found in deep water in the warmer parts of the Atlantic Ocean and Mediterranean.

**Oil Fuel**, see FUEL, Liquid Fuel.

**Oil of Vitriol**, see SULPHURIC ACID.

**Oil Paint**, see PAINTS and PIGMENTS.

**Oil Painters**, Royal Institute of, was founded in 1883, and achieved the prefix Royal in 1909. Ann. exhibitions are held at galleries in Piccadilly, London.

**Oil-painting**, see PAINTING.

**Oil Rivers**, see NIGER.

**Oil Rivers Protectorate**, former name of the Niger Coast Protectorate. It was given to the new protectorate proclaimed over the coastal area of Nigeria following the Berlin Act, 1885, and it included most of the present coast, but not Benin or the country to the W. In 1893 the name of the protectorate was changed to Niger Coast Protectorate. See further under NIGERIA.

**Oil-shale**, see SHALE OIL.

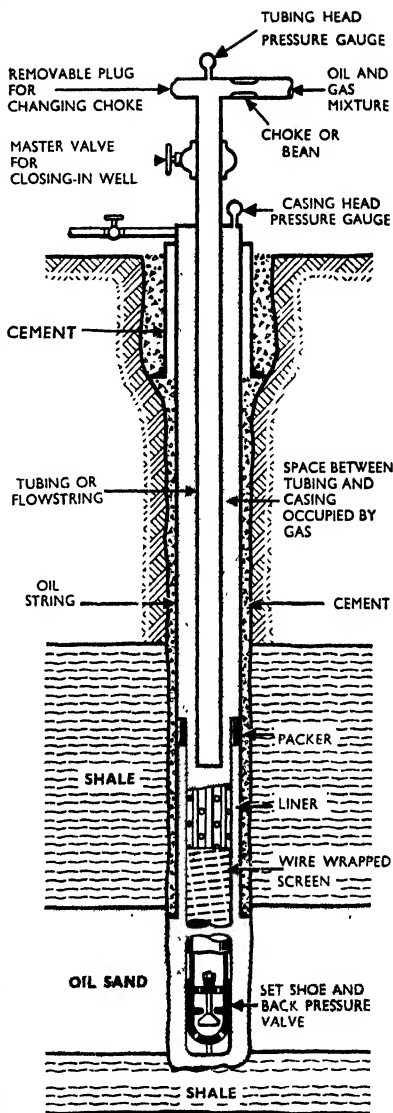
**Oil Tankers** form one of the classes of vessels which are expressly built for the transport of a certain class of cargo, and can under ordinary circumstances be used for no other. As early as 1863 there were sailing ships on the Tyne with specially constructed tanks for the carriage of oil, but the *Vaderland*, probably the first steamship designed to carry oil, was not built by Messrs Palmer, until 1872. Another early steamship of this type was the *Zoroaster*, built in Sweden in 1877, in which the oil tanks were separate from the hull; later vessels were built in which the plating of the hull itself formed the tank. The *Gluckauf* (2300 tons gross), built on the Tyne in 1886, is regarded as being the forerunner of the tanker of to-day, with machinery aft, and the hull divided into separate tanks by transverse and longitudinal bulkheads. At this time the hull was transversely framed, but in 1908 longitudinal framing, giving a stronger but lighter hull, was introduced. To-day tankers are built with longitudinal framing or on the combined system of transverse and longitudinal framing; the number of longitudinal bulkheads is invariably two. The first motor tanker was the Shell vessel *Vulcanus*, built in Holland in 1911. The Diesel engine has since been extensively used as the propelling machinery of tankers, but with the modern development of the giant tanker (see SHIPS and SHIPBUILDING), and with the modern demand for high-speed steam-driven pumps, steam turbines have reasserted their advantages. Ideally, oil can be transported in bulk more cheaply in one large vessel than in two small ones; a factor which, in the 'oil hungry' world of to-day, has led to the development of vessels of over 100,000 tons d.w.; in practice limitations imposed by port facilities, by berth and canal depths, and by the shortage of suitably large dry docks require that large numbers of

vessels of smaller size should be available. The standard general-purpose tanker in Great Britain is a turbine steamer of about 18,000 tons d.w. capable of 14½ knots, with steam-driven pumps. The modern tanker with machinery aft has a very characteristic profile, with forecastle, midship bridge structure, and poop with two or more decks. Combination vessels, able to carry oil in side and bottom tanks, or ore in central holds, are built. The design of a large tanker with a nuclear power plant was projected in Great Britain in 1957. For statistics see SHIPS AND SHIPBUILDING. See Laurence Dunn, *The World's Tankers*, 1956.

**Oil Wells.** The word 'oil' is applied in this case to rock oil or petroleum, which is found in various places at lesser or greater depths in the earth's crust. It most commonly occupies the pore spaces between the grains of sedimentary rocks. Two factors are essential to hold the petroleum in its reservoir. Firstly a suitable impervious 'cap' rock or seal to prevent its escape into higher layers, and, secondly, a 'structural' or 'stratigraphical' closure to trap the oil and prevent its further movement within the layer. The deposits are usually associated with water and gas—the water, being the heaviest, occupying the lower part of the structure. The method used in the recovering of petroleum from these natural reservoirs is by the sinking of wells.

The art of well-drilling dates back to 221 bc when it was first practised in China, where brine wells as deep as 3500 ft were drilled with equipment of a very primitive nature. The first well sunk with the definite object of obtaining oil, using other than hand power, was drilled at Titusville, Pennsylvania, in 1859 by Col. Drake. Investigations by geologists in a given area determine whether conditions in geological time have favoured the formation of oil. If so the terrain is studied for evidence of the types of structure in which oil is known to occur. Air surveying is widely used. Gravimeters are employed to measure differences in gravitational force resulting from variations in the densities of the rock layers beneath the surface. Rock layers can also be mapped by seismic methods. An explosion is set off at the surface, and sound waves reflected from the formations below are recorded by sensitive instruments to provide evidence of the depth and nature of the strata. Measurement of the earth's magnetic field and chemical analysis of surface soils may also be useful. Observations, if favourable, are checked by small-diameter borings.

The first well in an oil-field is usually known as a 'wild-cat.' All wells drilled with the object of discovering a new structure, a new pay zone, or of extending the productive area of known pay zones are 'exploratory' wells. Those wells extending a known field are 'extension' or 'outstepping' wells. Wells drilled for deeper pay sands in the same field are 'vertical exploration' wells, while those drilled within the known boundaries of a proven field are known as 'exploitation'



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FLOWING WELL: COMPONENT PARTS

or 'development' wells. In modern drilling the first structure of the drilling rig to be built is the derrick, this being,

in the case of permanent wells, a structural steel tower usually about 136 ft high. The 30-ft-square derrick floor, which is surfaced with boards and stands 8 to 14 ft off the ground, is the working platform for the crews. The hoisting winch or 'draw-works' by which the drill pipe, casing, and tubing are handled is driven by three or four engines installed behind it.

The hoisting equipment consists of the crown block (pulley) on top of the derrick and a travelling block which moves up and down the derrick by means of the hoist and a multiple cable arrangement. The drill proper consists of a steel drill-pipe with a cutting tool, known as a bit, at its lower end. The drill-pipe is rotated by a turntable mounted in the derrick floor. As the bit cuts deeper into the ground, new sections of drill-pipe are added to the drilling 'string'. The bit cuts a hole larger in diameter than the pipe, which is hollow. While drilling is in progress specially prepared mud is pumped down the pipe, through the bit, and up to the surface again in the space between the pipe and the sides of the borehole. This carries the rock cut by the bit to the surface (providing valuable specimens of the formations encountered by the drill), cools the bit, and forms a kind of plaster to prevent the walls of the borehole caving in. As the drill drives deeper the sides of the borehole are strengthened by successive 30-ft sections of steel casing, which is cemented into position. When a deposit is reached the oil, usually under great pressure, may be kept under control by maintaining a corresponding pressure of the circulating drilling mud. The drilling string is removed, and special tubing is run down the borehole to enable the oil to flow to the surface. The mud is then removed from the borehole, the flow at this stage being controlled by a system of valves and pipes at the wellhead known as a 'Christmas tree'. At first the oil rises to the surface under natural pressure, but later it may be necessary to lift it by mechanical pumping or by creating artificial pressures in the oil-bearing formation. In the last 100 years over a million O. W. have been drilled. Oil is produced from depths of over 17,000 ft, and exploratory boring has reached over 20,000 ft. The presence of oil deposits beneath the sea bed has led to the development of drilling from rigs on platforms or barges which form artificial is. See also *PETROLEUM*. See J. E. Brantly, *Rotary Drilling Handbook*, 1936; P. J. Jones, *Petroleum Production*, 1946-8; A. Beeby-Thompson, *Oilfield Exploration and Development* (2nd ed.), 1950; The Institute of Petroleum, *Modern Petroleum Technology* (2nd ed.), 1954; L. C. Uren, *Petroleum Production Engineering: Oil Field Development* (4th ed.), 1956.

**Oilcake**, richest and most concentrated of cattle foods, manuf. from oil-bearing seeds after they have been crushed to extract some of the oil. The cakes in most common use in Britain are those prepared from linseed, cotton seed, and soya-beans. Linseed cake contains from

9 to 11 per cent of oil, and if fed in moderate quantities is the best stock food of its kind. Decorticated cotton cake is made from cotton seed after the husk has been removed, and is valuable for fattening bullocks and dairy cows. Undecorticated cotton cake, made from the whole seed, is generally given to cattle fattening upon grass. Soya-bean cake, a recent introduction, is valuable for all classes of stock.

**Oilcloth**, see **FLOORCLOTH** and **LINO-LEUM**.

**Oils, Essential**, see **ESSENTIAL OILS**.

**Oils and Fats** are either glyceryl esters of the fatty acids (animal and vegetable oils) or hydrocarbons (mineral oils). In the former the relative proportion of solid and liquid glycerides determines whether the substance is a fat or an oil at ordinary temps. Oils may be colourless to yellow, are not miscible with water, have a sp. gr. of less than 1, and will be considered here as: (1) Mineral or hydrocarbon oils. This class includes a few essential oils mainly of vegetable origin, mineral oils like petroleum, oils obtained by distillation, coal-tar oils, shale oils, bone oils, etc. (2) Fatty oils, which may be saponifiable (i.e. hydrolysed by caustic alkalis or not). Saponifiable oils, etc., include glycerides and some essential oils, whilst non-saponifiable products include fusel oil, camphor oils, cholesterol, phenol, cresol, and many others. (1) *Hydrocarbon oils* are obtained either by the distillation of oil-bearing shales (Scotland) or from the petroleum of America, Russia, the Middle E., etc. The Scottish oils are mainly paraffins (q.v.), the Russian petroleum is composed chiefly of naphthenes, while the Amer. petroleum consists of paraffins, with aromatics and naphthenes. For commercial purposes crude petroleum is distilled and fractionated. Thus are obtained colourless oils used as solvents (petroleum ether), cleaning oils, and oils for varnishes, burning oils (kerosene), and lubricating oils (see *PETROLEUM*). These minerals are chemically more or less inert, and are unaffected by acids and alkalis at ordinary temps. (2) *Fatty oils* are obtained from animal fats and seeds of plants by pressure or extraction by volatile solvents. These fats and oils are chiefly composed of tristearin, tripalmitin, and triolein, and are easily decomposed to glycerol (q.v.) and the fatty acids (see *FAT*). They are soluble in ether, benzene, and chloroform, and are only slightly soluble in alcohol (except castor oil, which is soluble). The fatty oils are divisible into 3 groups: (i) *Drying oils*. These when exposed to the air absorb oxygen and harden. Such oils are valuable as painting oils, e.g. castor (dehydrated), linseed, poppy-seed, and fir-seed. (ii) *Non-drying oils* are used for lubricating purposes. Such are butter, lard, tallow, olive, palm, whale, seal, coconut oil, and castor (in natural state). (iii) *Semi-drying oils*, intermediate between (i) and (ii), e.g. rape (colza), castor, croton, and grape-seed oils. Boiled with caustic alkalis, fats and oils of this series undergo saponification, and are used in the manuf. of soaps (q.v.). Stearin is used in making candles, as also are palm oil and tallow.

Castor oil is used in certain types of lubrication, and in medicine, while some of these fats and oils are used as foods, viz. butter, lard, and coconut oil, and others as burning oils—colza and sperm oils.

The examination of oils and fats is a highly technical matter and involves such observations and determinations as taste and smell, colour, refractive index and dispersion, fluorescent effects, spectroscopic work and behaviour under polarised light, solubility in various solvents, heat of combustion, conductivity, melting point, sp. gr., viscosity, and complete chemical analysis, including the water content. In some cases *flash point* (q.v.) is a useful piece of information. Another important factor is the *iodine value*. Thus in Hübl's method an alcoholic solution of mercuric chloride and iodine in alcohol is made. Then a solution of the oil under test is made up in chloroform and the iodine solution added to it. Excess of the latter solution is used, and after adding potassium iodide solution the amount of the excess of iodine is found. From the results the amount of iodine absorbed by a known weight of the oil is then calculated. The Reichert value of a fat is obtained by heating 2.5 gm. of the fat with 5 ml. of pure alcohol and 6 ml. of strong KOH solution. After heating on the water-bath the soap produced is extracted with 70 ml. of boiling water and sulphuric acid of the proper strength to neutralise the alkali added. The liquid is distilled till 50 ml. have come over. The distillate is neutralised by decinormal alkali. The number of ml. used gives the Reichert value. The Maumené test depends on the heat produced when a fixed oil is mixed with sulphuric acid. Comparisons are made with standard cases.

**Oilseeds, Processing of.** The main processes through which O. pass for removal of the oil are cleaning, reducing, heating ('cooking'), and pressing or solvent extracting. In addition, it may be desirable to decorticate certain seeds (remove shells or hulls) and to delint cotton seed (remove short fibres or 'linters' remaining after ginning).

**SEED CLEANING.** O. received at a crushing mill usually contain varying amounts of extraneous matter—foreign seeds, sand, stones, metal, string, etc., which must first be removed to avoid adulteration of the final products and to protect processing machines against damage and unnecessary wear. The seeds are therefore passed either over a number of vibrating screens mounted in tiers and having the perforations diminishing in size from top to bottom, or through a declined rotating drum constructed from perforated plates with holes increasing in size towards the outlet. Sizes of holes are chosen to suit particular seeds and chutes are fitted to direct the seed and trash into separate conveyors and storage bins. Electromagnets are placed over conveyors and incorporated in chutes to remove tramp iron. Stones cannot, of course, be completely removed by screening, but can be separated from the seed by means of their greater density.

**SEED REDUCING.** This facilitates the extraction of oil but, as the structure and also the degree of fineness of the seed meal directly influence the oil yield obtained, the method of reduction used and size of particle produced must be selected to suit the physical character of the particular seed and the process by which the oil will be extracted. The seed is reduced by grinding or rolling to disintegrate a large proportion of the cellular membranes and so release the oil. Temp. rise during grinding or rolling should be kept to a minimum to avoid free flow of oil from the meal. Large seeds are first broken down either in a hammer type mill or by passing them through 'breaking' or 'cracking' rolls, but final reduction is usually by rolling. A set of breaking rolls consists of fluted steel rolls mounted in pairs, one of each pair being spring loaded, and may be up to 4 pairs high. The pitch of the flutes (V-shaped grooves), cut spirally along each roll, is the same for rolls which are paired, but is reduced on lower rolls so that, together with an adjustment of the clearance between the rolls, particles of the required size can be produced. Reduction of the seed is achieved by rotating the paired rolls at differential speeds, thereby producing a shearing or scissors effect between the cutting edges of the flutes. Lower rolls are rotated at higher speeds to prevent hold up of seed and blockage. The broken seed is then passed between heavy steel rolls mounted one above the other and with each roll supporting the weight of all the rolls above it, thereby subjecting the seed to increasing pressure as it passes back and forth between adjoining rolls from top to bottom of the assembly. There are five rolls about 16 in. in diameter by 4 ft long, per set (Anglo-Amor, Five-High Rolls), the top or second roll being fluted to ensure that the broken seed fed to it is 'nipped' and carried forward whereas the remaining rolls are usually smooth. A plate is fitted along the top of each roll on the feed side to guide the material between rolls. Seed passed through these rolls may be reduced to particles a few thousandths of an inch in thickness, but the size must be chosen to suit the oil extraction process. For solvent extraction of the oil, the particles are pressed into thin flakes by a single passage through a pair of large diameter smooth rolls, one of which is fitted with heavy springs at its bearing blocks to maintain pressure between rolls and is adjustable for minimum flake thickness. The size and thickness of flakes play a most important part in the solvent extraction process, and although the rate of oil diffusion is directly proportional to the surface area and inversely proportional to the thickness, flakes must have sufficient mechanical strength to withstand handling and filling into extractor vessels and also to allow flow of solvent through the flake mass.

**COOKING OF OILSEEDS.** Although a proportion of the oil in seed may have been liberated during rolling, a considerable number of the ultramicroscopic oil cells still remain intact and must be so

treated as to induce them to yield up their oil. Heat treatment ('cooking') is known to achieve this, but the complex changes which take place, both chemical and physicochemical in nature, have not so far been fully explained, and the conditions of temp., moisture, and degree of grinding most suitable for the seed being processed and the method of oil extraction are found chiefly by experience.

Subjecting the moistened seed particles to heat causes the oil and moisture to expand, thereby rupturing the cells, lowers the viscosity of the oil, reduces the surface tension of the oil interface and denatures and coagulates the proteins, so that some of the oil is released to the surface of the particle. The oil is further displaced by the moisture, because the latter has a lower surface tension at the boundary surface and is attracted by the hydrophilic gels of the seed, and is then in a suitable state to flow freely during pressing. Heat alone will not liberate the oil completely; in excess, in the absence of moisture, it will cause the oil to adhere more closely to the surface of the particles, due to reduced surface tension, destroying the granular nature of the meal and so forming a pasty mass which prevents oil flowing freely.

The process of cooking—heating, addition of moisture, and drying—is carried out generally in a 'kettle,' which consists of a series of closed, superimposed cylindrical pans, each of which is independently jacketed for steam heating and is equipped with a stirrer. An automatically controlled gate or flap is fitted to an outlet in the bottom of each pan, except the last, for discharging the meal to the pan below at a predetermined rate. The bottom-most outlet is manually operated to suit the machine being fed. There may be up to 5 pans in a series, the top one or two being provided with spray jets, for the addition of moisture to the meal, and the lower ones provided with exhaust ducting and fan for removal of moisture. It is thus possible to control the time of cooking, the moisture of the seed meal during each stage of cooking, and also the final moisture content. There are also pressure-type cookers in use, consisting of horizontal jacketed tubes with close-fitting stirrers, which agitate the meal and convey it through the tube. Nozzles are fitted for direct injection of steam at the beginning of the cooking process. In addition, the meal may be passed along steam-jacketed conveyors prior to entering the cooker, and through dryers after cooking to reduce the moisture content to suit the oil extraction process.

**PRESSING.** *Hydraulic press.* There are 2 main types, the 'open' Anglo-Amor, and the 'closed' or cage press. The 'open' press consists of 4 heavy vertical steel columns secured at the top and bottom to heavy blocks, the bottom one of which incorporates a hydraulic cylinder and ram. Suspended from the top, and closely filling the space enclosed by the columns, is a series of up to 24 corrugated horizontal plates. These are equally spaced at intervals of 2-4 in. and are suspended, one from the other, by linkages which permit

the assembly to be closed up. Pressure applied from below is evenly distributed over the plate area by a heavy bottom plate attached to the ram. The cooked meal to be pressed is moulded into cakes, by a machine located immediately below the kettle outlet, placed in strong woollen or nylon wrappers, and inserted between the metal plates. Pressure is applied in two or three stages by raising the ram, which closes up the plates, compresses the meal, and causes most of the oil to flow out. The 'closed' or cage press has vertical columns with top and bottom end blocks and hydraulic cylinder with ram similar to the open press, but the plates are replaced by a strong cage of round or square section made up from a number of closely spaced steel bars or slotted plates, ringed by heavy steel bands or supported in a steel frame. The length of the cage is such as to allow for filling at the top. During pressing, the space between cage and press head is occupied by a vertically hinged heavy block, which may close the cage solidly and restrict the applied pressure to the lower end of the charge as the ram passes up and into the cage, or the block may be of suitable cross-section for it to enter the cage during pressing, in which case the cage floats between the lower ram and opposing head and pressure is applied to both ends of the seed mass. There is a tendency for the oil to flow longitudinally rather than radially through the compressed cake, and the seed meal is therefore divided into layers by drainage plates or press cloths which are placed in the cage at intervals during filling. The oil is squeezed out through the narrow spaces between the cage bars and falls into drip-trays to be pumped to screens and filter-presses for removal of fine meal ('fines') before refining. Pressures in the region of 6000 lb. per sq. in. are possible with the cage press, whereas the maximum pressure on the cake in an open press is about 1700 lb. per sq. in. Although these presses have been almost completely replaced by continuous screw presses, the hydraulic cage press is still used for cold extraction of special oils, e.g. first pressing of castor beans to produce medicinal oil, the oil remaining in the residue being in this case extracted with solvent for technical purposes.

*Continuous screw press* is used throughout the world for the mechanical expression of oil from most varieties of O. It resembles a large elongated mincing-machine, and consists of a central worm shaft or screw rotating in a cage or 'barrel' made up from flat steel bars spaced a few thousandths of an inch apart. Pressure may be applied to a comparatively small extent by restricting the discharge of cake through the annular orifice at the end of the barrel, but high pressure is built up within the cage by combining this with a decrease in the pitch of the worm along the shaft, a gradual increase in diameter of the screw boss and reduction in diameter of the cage towards the discharge end. The size of orifice or choke may be adjustable, while the machine is working, so that the pressure may be regulated to suit a

particular seed. As a result of the high compression, oil is expelled from the meal through the spaces between the cage bars. Screw presses may be divided into 3 types: low pressure, high pressure, and a combination of low- and high-pressure sections. Low-pressure screw presses, with comparatively high capacities, are used for removal of a proportion of the oil from seeds with a high oil content, so that the residue may be more satisfactorily treated in a high-pressure screw press or solvent extraction plant. A combined machine may have the low-pressure section mounted vertically over the feed end of the high-pressure unit or, alternatively, it may have a horizontal multi-stage barrel with the shaft made up of 2 sections and driven by independent motors at different speeds. Depth and pitch of flights and shaft speeds are chosen to produce the pressures required. Screw press plants are automatic in most respects and are so arranged that flow of cleaned seed from storage bins and through all pre-treatment processes is automatically controlled by the feed to the expellers, which is regulated manually to suit variations in character of seed. Labour requirements are very small and generally of a supervisory nature only. Cake produced by high pressure and combined screw presses contains between 4 per cent and 7 per cent of oil, the amount varying according to the characteristics of the seed being crushed.

**SOLVENT EXTRACTION.** Solvent extraction plants involve either a batch or a continuous process. In a batch plant the hot flaked seed is delivered into a cylindrical pressure vessel, which may be mounted horizontally either on a shaft running in trunnion bearings or on rollers, by means of which it can be rotated on its longitudinal axis, or it may be installed in a fixed vertical position, in which case a shaft with stirrers is fitted. Grids and filters are fitted for drainage purposes and to prevent escape of fine meal during counter-current washing with solvent and during steaming. Hydrocarbon solvent is pumped into the sealed vessel at the bottom until full, when the flow is reversed to force out a mixture of solvent and oil ('miscella') from the bottom. Washing is continued until almost all the oil is leached out of the seed. The miscella of different concentrations is stored in separate tanks; the most concentrated miscella is passed to a distillation plant for removal of solvent, and the miscella of lower concentrations is pumped through following batches of seed to raise its concentration to a level suitable for distillation. Medium strength miscella is therefore pumped through a new charge of seed, followed by weak miscella and fresh solvent. In this way the solvent content of the final miscella and hence the size of distillation plant are kept to a minimum. After allowing time for draining, the meal is agitated while steam is passed through it to remove all traces of solvent. Batch extractor vessels of the vertical type are usually arranged in a line and operated as a semi-continuous process. The oil is leached out by counter-current washing

with solvent pumped through sev. of them in series, entering the line at a vessel containing nearly oil-free material and emerging as concentrated miscella from a vessel containing flakes of a high oil content. At regular intervals, one vessel, containing meal from which almost all the oil has been leached away, is disconnected from the head of the series and another freshly filled with flakes is added to the tail. In a continuous plant the process is taken a stage further, the flakes being moved by various means counter to the flow of solvent. In the Bollman (Hansa-Mühle) extractor, the seed flakes are fed automatically into metal baskets or buckets with perforated bottoms, pivoted between endless chains running over sprockets, within a gas-tight case, similar to a vertical bucket elevator. Fresh solvent is sprayed into the flakes containing the least oil, i.e. near the top of the 'up' side, and allowed to drain through to the bucket, and subsequent buckets, below. Miscella of increasing concentrations is collected at various points and pumped into baskets on the down side containing flakes of high oil content. As each bucket arrives at the top, containing meal from which almost all the oil has been leached and solvent drained, it is inverted, and the meal is transferred to a conveyor which passes through the extractor case to desolventisers. The miscella which has drained into tanks on the down side is pumped away to evaporators for removal of solvent. Fanth and De Smet extractors utilise a continuously moving belt of filter cloth to convey the flakes through a long, sealed chamber. Miscella and fresh solvent sprayed on to the moving layer of flakes at intervals percolate through the flakes and filter by gravity into tanks beneath to be recirculated or pumped to evaporators when sufficiently concentrated. A number of other designs incorporate vertical and/or inclined tubes through which the flakes are moved by various means counter to the flow of solvent. In the Bonotto extractor flakes fall at a controlled rate from equally spaced disks mounted on a central common shaft in a vertical tube while solvent passes up the tube. Rate of passage of flakes down the tube is controlled by rotating the plate assembly at a predetermined speed, and having stationary scraper arms sweep the meal through a slot in each plate to the surface of the plate below. As the spent flakes reach the bottom of the column they are discharged by a screw mechanism through a cone-type orifice adjusted to effect compression of the flakes and expression of most of the solvent. The extractor patented by Hildebrandt consists of 2 vertical tubes interconnected at the bottom by a third horizontal tube, each tube being provided with a screw conveyor with close-fitting perforated flights. Flakes are conveyed down one leg into the solvent (miscella) across to the second leg, and up above the level of solvent in the latter, where they drain before being discharged. Concentrated miscella is discharged near the top of the first tube



through a section provided with fine vertical slots which restrict passage of flake particles. Allis-Chalmers and Ford extractors are similar in principle to the Bonotto and Hildebrandt extractors respectively. Miscella from batch and continuous plants is first filtered to remove fine particles of meal and is then passed through a system of evaporators to remove all traces of solvent. Most of the solvent is removed in evaporators equipped with steam coils, but final stripping is carried out with live steam, sometimes under reduced pressure. The vapours are condensed in water-cooled condensers and separated by gravity, the water to be run to drain and the solvent returned to storage tanks for re-use. Finally, all air vented from the system to atmosphere is either washed by refrigerated brine or passed through adsorption towers containing activated carbon to remove the last trace of solvent. The crude oil is pumped into tanks to await dispatch to processors. Treatment of the meal consists of steaming and drying in the batch extractor vessel or in heated tubes fitted with worm conveyors, after which it is ground and cooled for storage or dispatch. It usually contains about 1 per cent of oil. *See also* COCONUT; COCONUT OIL; COTTON-SEED; GROUNDNUT OIL; LINSEED OIL; PALM OIL; PALM-KERNEL OIL; SAFFLOWER OIL; SOYA BEAN; SOYA BEAN OIL; SUNFLOWER OIL; TUNG OIL.

**Ointment**, fatty substance of the consistence of butter, generally containing some medicinal agent, and intended to be applied to the skin for curative purposes. The fatty basis may be any substance sufficiently plastic, without any injurious action on the tissues and not liable to putrefaction; that most generally used is purified lard with an admixture of wax, the usual proportion being 80 parts of lard to 20 of wax. A harder O., used for conveying liquid antiseptics, is made up of 4 parts of solid paraffin, 1 of wool fat, and 5 of liquid paraffin. A soft O. base in general use consists of 11 parts of solid paraffin, 5 of lanolin, and 34 of liquid paraffin.

**Oireachtas**, name of the Parliament of the Rep. of Ireland. It consists of the President of the Rep., a Lower House, called *Dáil Éireann* (q.v.), and a Senate, called *Seanad Éireann*. *Dáil Éireann* comprises 147 members (T. D.s) elected by adult suffrage. *Seanad Éireann* has 60 members, of which 11 are nominated by the *Taoiseach* (Prime Minister), 6 are elected by the univs., and 43 are elected from panels of candidates representing the following 5 interests: (i) National language and culture, literature, art, education, etc.; (ii) Agriculture and fisheries; (iii) Labour; (iv) Industry and commerce; (v) Public administration and social services.

**Oïrot**, autonomous region of the R.S.F.S.R., *see* GORNO-ALTAY.

**Oisanite**, *see* ANATASE.

**Oise**, 1. Dept in the N. of France, formed of parts of the anct provs. of Ile-de-France and Picardy. In general flat, it is well watered, mainly by the O. and

its tribs. It produces a great deal of agric. produce, and is known for its live-stock breeding. The prin. manufs. are textiles, sugar, and glass, and there are metallurgical industries. The chief tns are Beauvais (the cap.), Clermont, Compiègne, Senlis, and Reil (q.q.v.). Area 2272 sq. m.; pop. 396,700. *See also* VEXIN.

2. Riv. of France, an affluent of the Seine, rises in the N. of the dept of Ardennes, and flows SW., joining the Seine at Conflans-Sainte-Honorine after a course of 150 m., for the last 75 of which it is navigable.

**Oisin**, *see* OSSIAN.

**Oita**, city and seaport of Oitaken, NE. Kyushu, Japan, 100 m. from Nagasaki. Silk yarn and textiles, cement, and metal wares are produced. Pop. 112,000.

**Ojibwa**, *see* CHIPPEWYANS.

**Ojos del Salado**, name of Andean peak on the Chilean-Argentine border. A new survey in 1955 claimed that it may be the highest in the whole of the W. hemisphere (*see* ACONCAGUA).

**Oka**, navigable riv. in central Russia, right trib. of the Volga. It rises in the central Russian upland and flows NE., joining the Volga at Gor'kiy. Length, 940 m.; main ports Gor'kiy, Ityazan', Dzerzhinsk, Kaluga.

**Okapi**, native name of the species of Giraffidae discovered by Sir Harry Johnston in 1901 in the Semliki forest, Belgian Congo; it is known technically as *Okapia johnstoni*. This giraffe-like animal differs from its allies in having a rather short tail, a short, thick neck, and no external horns, but vestiges of horns are to be found on the frontal bone. The coloration of the O. is curious: the limbs bear long, dark stripes, the back and sides are reddish-brown, while the limbs and part of the head are of a creamy colour. Very little is known of the habits of the O. beyond that they live in pairs in dense forests.

**Okayama**, city of Okayamaken, Japan, seat of the prefectural gov., 72 m. W. of Kobe. It has a fine castle and beautiful gardens. Silk and cottons are produced. Pop. 235,000.

**O'Keefe**, or **O'Keefe**, John (1747-1833), dramatist and actor, b. Dublin. His plays enjoyed considerable popularity in London. They include comedies, farces, and operas, such as *The Agreeable Surprise*, 1781, *The Poor Soldier*, 1783, *Wild Oats*, 1791, and *Modern Antiques*, 1791. The popular song 'I am a friar of orders grey' occurs in his opera *Merry Sherwood*. He was blind from about 1797. His *Recollections* appeared in 1826. *See* lives by R. W. Babcock, 1937, and Adelaide O'Keefe, 1937.

**Okehampton**, municipal bor. and mkt tn of Devon, England, 21 m. W. of Exeter, on the N. margin of Dartmoor, at the junction of the E. and W. Okement. There are picturesque ruins of a late Norman keep and of O. Castle. Pop. 3900.

**O'Kelly**, Sean Thomas (Seán Tomas O'Callaigh) (1882- ), Irish journalist and political leader. He was educ. at O'Connell Schools, Dublin, and was returned as

Republican M.P. for N. Dublin in 1918. One of the original members of the Sinn Féin (q.v.) movement, he was Speaker of the first Dáil Éireann. He was Irish envoy to Paris and Rome, 1919-22, and to the U.S.A., 1924-6. From 1927 to 1945 he represented Dublin N. in the Dáil, and was successively vice-president of the executive council and minister for local gov. and public health, 1932-9, and minister for finance and for education. O.K. was proprietor and editor of the *Nation*, general secretary of the Gaelic League, and vice-president of the Fianna Fáil (q.v.) party. On 25 June 1945 he succeeded Dr Douglas Hyde (q.v.) as President of Ireland. He was re-elected president, without opposition, in May 1952.

**Oken, Lorenz** (1779-1851), Ger. naturalist, b. Bohlsbach, Swabia. His real name was Okenfuss. In 1802 he pub. a work entitled *Grundriss der Naturphilosophie, der Theorie der Sinne, und der darauf gegründeten Classification der Thiere*, first of a series of works of the same nature. In 1828 he was appointed prof. at Munich, and 4 years later at Zürich. See M. Pfannenstiel and It. Zaunick, *Lorenz Oken und J. W. Goethe*, 1941.

**Okhotsk, Sea of**, inlet of the N. Pacific in the E. of Siberia, divided from the ocean by Kamchatka Peninsula and Kuril Is. and from the Sea of Japan by Sakhalin and Hokkaido Is. Its main trib. is the R. Amur; chief ports: Magadan and Korsakov.

**Okhrida**, see OHRID.

**Oki Islands**, group of is. lying in the Japan Sea N. of Shimanek, Japan. There are, in all, 4 is., Iodo being the largest; chief tn, Saigo. The group has a coastline of 182 m., and covers an area of 130 sq. m.

**Okinawa**, Pacific is. of the Ryukyu group, 325 m. from the Jap. mainland, the centre of a former Jap. prefecture, and an air base. It is long and narrow, with an irregular coastline and peninsulas projecting W. and E. Length from N. to S., 65 m.; maximum width, 10 m.; area, 485 sq. m. For the Amer. capture of O. in 1945, see PACIFIC CAMPAIGNS, or FAR EASTERN FRONT, IN SECOND WORLD WAR.

**Oklahoma** (Choctaw Indian word meaning 'red people'), S.-central state of the U.S.A., called the Sooner State, bounded on the N. by Kansas and Colorado, E. by Missouri and Arkansas, W. and S. by Texas. One narrow strip touches New Mexico and Colorado on the W. Area 69,919 sq. m., including 643 sq. m. of water. The surface is principally an upland prairie, and large portions are very fertile, though others are bare and arid. O. rises in the W. to an elevation of 5000 ft and there are mts in the SW. It is well watered by the Red, Canadian, and Arkansas R.s. with their affluents. The chief mt ranges are the Wichita Mts in the S. part of the state; the Chautauqua Mts in the central portion; and the Ozark Mts, extending half way across the state. O. is noted for its diversity of crops: corn, cotton, wheat, oats, peanuts, maize,

potatoes, truck crops, and fruits are extensively cultivated. The first-named represents over two-thirds of the acreage and value. Yields in 1947: maize, 22 million bushels; wheat, 104 million; oats, 33 million; grain sorghums, 5 million. Soil erosion is serious. Between 1935 and 1940 the number of farms declined by 15.9 per cent (33,600), and between 1940 and 1945 by nearly 15,000, or another 8.3 per cent. Farm acreage totals 36 million, with 14 million under crops. The state also possesses an abundance of fine timber, and wool is produced. Petroleum, coal, rock asphalt, limestone, and gypsum are found, the value of the total mineral output for 1946 being \$326 million. O. ranks fourth nationally in petroleum production, with 187,789,000 barrels in 1953. Indians, wards of the nation, received (in 1930) over \$36 million in royalties on oil discovered in their lands. About 280 million gallons of natural gasoline and 345,000 million cub. ft of natural gas were produced in 1945. The state has a Senate of 44 members and a House of Representatives of 123 members elected for 4 and 2 years respectively. O. sends 2 senators and 6 representatives to Congress. The state was a part of the Louisiana Purchase. From 1866 onward the Indian country, as it was known, became gradually settled by the purchase of Indian lands by the gov. Organised as a ter. in 1890, and admitted as a state in 1907, it was originally known as Indian Ter. because on the great reservations were settled Cherokees, Creeks, Choctaws, Chickasaws, and Seminoles. Their descendants remain a large part of the present pop. of O. The chief cities are O. City (cap.), 243,504; Tulsa, 182,470; Muskogee, 37,289; Enid, 36,017; Lawton, 34,757; Shawnee, 22,498; Ponca City, 20,180; Bartlesville, 19,225; Okmulgee, 18,317; Ardmore, 17,890. Pop. of the state, 2,233,350. See Edna Ferber, *Cimarron*, 1936; Federal Writers' Project, *Oklahoma: a Guide to the Sooner State*, 1941; G. Foreman, *A History of Oklahoma*, 1942; A. Dobo, *Prairie City*, 1944; M. James, *The Cherokee Strip*, 1947.

**Oklahoma City**, cap. of Oklahoma, U.S.A., on the N. fork of the Canadian R. It is a new city settled in 1889, and has many handsome buildings and tree-lined streets. It is an important commercial, industrial, and distribution centre for a rich oil-producing and agric. area; there are petroleum refining and printing and publishing industries, and steel and iron products, wood products, clothing, pottery, bedding, and paints are manuf. O. C. Univ. was founded in 1911. Pop. 243,504.

**Okmulgee**, city, cap. of O. co., E. central Oklahoma, U.S.A. It is a trade and industrial centre for an oil-producing and agric. area. It has oil-refining, glass-making, cotton-ginning, and meat-packing. Near by is Lake O. Pop. 18,317.

**Oktyabr'skiy**, tn in Bashkiria (Russia), 90 m. W. of Ufa, rapidly growing centre of the Tartar-Bashkir oil-fields, and the starting-point of pipeline to Ufa. Founded

in 1940, it became a tn in 1946. Pop. (1956) 63,000, mostly Russian.

**Okuni-Nushi**, see OHONAMOCHI.

**Olaf I (Olaf Tryggvason)** (c. 960–1000), King of Norway. On being proclaimed king in 995 he began the conversion of the country to Christianity, built the first churches, and founded the see of Nidaros, or Trondheim. He fought with both Sweden and Denmark, and finally met his death off the is. of Svöld, near Rügen, where he was waylaid and defeated by the combined Swedish and Dan. fleets.

**Olaf II, the Saint** (995–1030), king and patron saint of Norway. He wrested the throne from Eric and Earl Sweyn (Svend Jarl) in 1015, and then tried to suppress paganism with such severity that some of his subjects sought protection in the ters. of Canute. O. was dethroned by Canute in 1028, but in 1030 he returned to Norway with an army. In a battle with Canute at Stiklestad O. was defeated and killed. He was canonised in 1164 and recognised as patron saint of Norway.

**Olaf VI (Alexander Eduard Christian Frederik)** (1903–), King of Norway. He succeeded his father, Haakon VII (q.v.), in 1957. His education included 2 years' study at Balliol College, Oxford. He married (1929) Princess Martha of Sweden (d. 1954), and their only son, Prince Harald (b. 1937), is heir presumptive to the Norwegian throne. O. became commander-in-chief of the Norwegian armed forces in 1944, and shared the war-time exile of the rest of the Norwegian royal family.

**Olafsson, Eggert** (1726–68), Icelandic naturalist, poet, and patriot who, in company with Bjarni Pálsson (q.v.), travelled throughout Iceland (1752–7) exploring the country. Of their travels they wrote a detailed account which was pub. in Dan. in 1772 and subsequently in various other languages (English 1805, abridged). See biography in English, 1925, by H. Hermannsson.

**Olafsson, Jón** (1850–1916), Icelandic poet, journalist, and politician, noted for his masterly trans., e.g. that of Mill's *On Liberty*. He said himself that his corner of the poetic field was a small one, but he hoped it was his own, and indeed it is.

**Olafsson, Páll** (1827–1905), Icelandic poet (brother of Jón O.), whose charming songs and humorous verses have for a cent. been on the lips of every Icelander. His poetry is characterised by a peculiar grace and melodiousness.

**Olafsson, Stefán** (1619–88), Icelandic poet and divine. He trans. the Younger Edda into Latin, and also the great philosophical poem, *Völuspá* (q.v.), of the Elder Edda. Mazarin offered him a post under the Fr. Gov. to translate and edit Old Icelandic classics. This tempting offer he was naturally inclined to accept, but was dissuaded from doing so by Bishop Brynjólfur Sveinsson (q.v.). Whatever the worthy bishop's motive may have been, its purity is suspected even to-day. With Hallgrímur Pétursson (q.v.), O. towers above his contemporary Icelandic poets. Many of his poems are so modern in spirit, form, and diction that they might

have been written in the present cent., and some of his love poems are among the best in the language.

**Ólafur Thórdarson** (d. 1259), Icelandic poet and scholar, nephew of Snorri Sturluson and brother of Sturla Thórdarson (q.v.). Some incomplete poems of his have been preserved, and an important grammatical treatise. See Finnur Jonsson's ed., 1927.

**Óland**, long and narrow Swedish is. in the Baltic, separated from Sweden by Kalmar Sound. It is 85 m. long and 10 m. at its broadest, and covers an area of 519 sq. m. It is well wooded in parts, and has good pasture ground for cattle. There are good fisheries all round the coast, also cement and alum works; grain and sandstone are largely exported. Borgholm, on the W. coast, is the cap. and only tn. Pop. 27,000, of whom 2423 are in Borgholm.

**Ólafur, Páll Eggert** (1883–1949), Icelandic scholar, author of numerous works on Icelandic hist. and biography. His *Íslenskar æviskrár* (Icelandic Dictionary of National Biography), 5 vols., is occasionally referred to in this Encyclopaedia.

**Olauas Petri**, see PETER.

**Olawa** (Ger. Ohlau), tn of Poland, in Wrocław prov., 17 m. SE. of Wrocław (q.v.). It lies near the Oder (q.v.), on a canal linking that riv. to the O. It. There is a Gothic church, and there are metal industries. Pop. 8000.

**Olax**, typical genus of the family Olacaceae, consists of about 30 shrubs and trees inhabiting tropical regions of Asia, Africa, and Australia. The species are smooth evergreens, and have a disagreeable odour. *O. zeylanica* is the mallatree of Ceylon, the leaves of which form an ingredient of curry.

**Olbers, Heinrich Wilhelm Matthäus** (Matthias) (1758–1840), (Ger. physician and astronomer, b. Arbergen, near Bremen, studied medicine at Göttingen (1777–80). His new method of calculating the orbit of a comet won him fame. He discovered the asteroids Pallas (1802) and Vesta (1807), and the O. comet of 1815. See Barkhausen, *Biographische Skizzen verstorbener Bremischer Aerzte*, 1844.

**Old Age Pensions**, see NATIONAL INSURANCE ACT, 1946 and RETIREMENT PENSIONS.

**Old Bailey**, name of a street in the city of London, between Newgate St and Ludgate Hill, and commonly applied to the Central Criminal Court (q.v.). The Bailey, as it was originally called, was no doubt an outwork in front of the city wall. The first extant reference to the O. B. is dated 1444–5. The M.E. word *bailey*, appearing also in the forms *bail* and *bayle*, is from Medieval Lat. *ballium*, meaning the courts or wards of a castle formed by spaces between the circuits of defences surrounding the keep. The name *bailey* in this context is often retained after the disappearance of the castle and its defences. From very early times a gallows existed near the Horse Pool in Smithfield (sometimes called Smithfield Pond), only a short distance from the city gate (New Gate) at this point. It was

called the 'Elms' because of the quantity of such trees in the neighbourhood. With building development at Smithfield, the gallows were moved further W. Newgate (q.v.) early became the common jail for London and Middx, and the sessions at the O. B. have from time immemorial been held under the commission of Jail Delivery (q.v.) for Newgate and of Oyer and Terminer (q.v.) for the city. Up to 1906 the sittings of the Central Criminal Court were held in the old court house, but a new building designed by E. W. Mountford was opened in 1907, and now occupies almost the whole site of what was once Newgate Prison. The interior of the new court, which has sometimes and without regard to hist. been termed the New Bailey, is lofty and imposing, and over a great part of the vaulted ceilings are brilliantly coloured frescoes.

**Old Believers**, see RASKOLNIK.

**Old Beni-Hassan**, see BENI-HASSAN-EL-QADYM.

**Old Calabar**, see CALABAR.

**Old Castle**, see CASTILLA LA VIEJA.

**Old Catholics**, see CATHOLICS, OLD.

**Old Colony State**, see MASSACHUSETTS.

**Old Contemptibles**, see 'CONTEMPTIBLE LITTLE ARMY.'

**Old Dominion**, see VIRGINIA.

**Old English**, see ENGLISH LANGUAGE and ENGLISH LITERATURE.



T. Fall

OLD ENGLISH SHEEP-DOG

**Old English Sheep-dog** ('Bohtail'), formerly much used, and developed to a high degree of intelligence, by shepherds and drovers in the S. cos. of England and Wales, but now a favourite show dog. The hard, shaggy coat should be free from curl, and have a dense waterproof undercoat. Its colour may be any shade of grey, grizzle, blue, or blue merle, with or without white markings. The head should be big and square with a long, strong jaw, black nose, and small eyes; the ears should be small and covered with wavy hairs. The forelegs are straight, and the feet small and round. The body should be square and short, and the hind-quarters high and heavy. The tail ought to be absent naturally, and puppies that are born with one should be docked when not more than 4 days old. Exercise for this breed is essential, and no dog suffers more from being kept chained up. Many

instances of the great intelligence of typical specimens of the breed are related, and they are valuable equally as stock or pet dogs or as companions and house dogs.

**'Old Glory,'** flag of the U.S.A., see FLAG.

**Old Meldrum**, burgh of Aberdeenshire, Scotland,  $\frac{1}{2}$  m. from Inverurie. On Barra Hill (634 ft.), 1 m. S., is a prehistoric fort. Pop. 1100.

**Old Monkland**, see MONKLAND.

**Old Point Comfort**, watering-place of Elizabeth City co., Virginia, U.S.A., at the N. side of the entrance to Hampton Roads (q.v.).

**'Old Pretender,'** see STUART, JAMES FRANCIS EDWARD.

**Old Red Sandstone**, name given to the succession of sandstones, shales, and thin bands of concretionary limestones which lie between the Silurian and Carboniferous rocks. These rocks were laid down on land or in isolated basins or lakes in the W. and N. of Europe. To the S. marine conditions prevailed, and marine sediments were deposited. The term Devonian is applied to these rocks, and to the period in which they and the rocks of continental origin (the O. R. S.) were deposited. The O. R. S. attains a thickness of about 20,000 ft in Scotland, and is subdivided into lower, middle, and upper groups. Enormous masses of contemporaneous felsitic, andesitic, and diabasic lavas and tufts are found in the O. R. S. of central Scotland, giving origin to the Cheviots, Pentland Hills, Siddlaws, and Ochils. The fauna of the period is remarkable for its fishes, such as *Palaeospondylus*, *Coccosteus*, *Dipterus*, and *Holoptichius*, giant arthropods and a few marsh plants (*Psilophyton*) are also found. In Norway, N. Russia, and Spitsbergen, O. R. S. rocks occur with typical fishes and plant remains, and the O. R. S. of N. America (New Brunswick) yields plant remains and occasional seams of coal.

**Old Sarum**, see SARUM.

**Old Testament**, see BIBLE.

**Old Vic Theatre**, opened in 1818 as the Royal Coburg; in 1833 the name was changed to the Royal Victoria Theatre in honour of the young princess. In 1879 Emma Cons, a social worker, was appointed manager of the theatre, and it was reopened as the Royal Victoria Coffee Music Hall, offering 'a purified entertainment and no intoxicating drinks.' In 1886 sufficient funds were gathered to buy the freehold of the theatre and vest it in a trust under the charity commissioners on behalf of the people of London. In 1898 Lillian Baylis, niece of Emma Cons, joined her as manager of the theatre. The first complete season of Shakespeare's plays was presented in 1914, and by 1923 the O. V. had become the first theatre in the world to present the complete cycle. In 1929 Ninette de Valois joined the theatre and laid the foundations of the Sadler's Wells Ballet; the new theatre at Sadler's Wells was opened in 1931.

Lillian Baylis d. in 1937. In 1940 the drama, opera, and ballet companies were based at the Victoria Theatre, Burnley, Lancs, and numerous tours were carried

out from there. The drama company returned to London in 1944 and was housed at the New Theatre (q.v.), as the O. V. had been damaged by enemy action. The necessary repairs were made in 1950 and the theatre was reopened in Nov. of that year. In the autumn of 1953 the management of the O. V. launched a plan to present in 5 consecutive seasons the whole of the 36 plays in the First Folio of Shakespeare. O. V. companies have visited America, Canada, Australia, New Zealand, S. Africa, Italy, Malta, Portugal, Egypt, Greece, France, Holland, Germany, the Scandinavian countries, and Finland. The O. V. is also responsible for the Theatre Royal at Bristol, where the Bristol O. V. Co. presents seasons of plays and where a school of acting is maintained. See Sybil and Russell Thorndike, *Lilian Baylis*, 1937; E. J. Dent, *A Theatre for Everybody*, 1945; Audrey Williamson, *Old Vic Drama*, 1948, 1953; Harcourt Williams, *Old Vic Saga*, 1949; R. Wood and M. Clarke, *Shakespeare at the Old Vic*, 1953-4, 1954, 1954-5, 1955, 1955-6, 1956, 1956-7, 1957.

**Oldbury**, tn of Wores, England, 5 m. WNW. of Birmingham, on the Birmingham canal. It has iron and steel industries, tube, chemical, aluminium, and brick and tile works. With Halesowen it forms a bor. constituency in Wores. Pop. 53,820.

**Oldcastle**, Sir John, also known as Lord Cobham (d. 1417), Lollard and rebel. He was a Herefordshire knight, helped to suppress Glendower's rising, and later fought for Henry IV in France. He is said to have been a friend of Prince Henry, later Henry V. In 1409 he married Joan, Lady Cobham, and was summoned to Parliament as Baron Cobham until 1413. In that year Arundel found him guilty of heresy, but O. escaped from the Tower, hiding first in London, then in the Midlands, and finally in Wales. He was declared outlawed (1414) and seems to have plotted various rebellions. He was later captured and executed. O. has been thought by some to be the original of Shakespeare's Falstaff.

**Oldcastle**, mrlkt tn and important archaeological centre (Slabh na Caillighe), of co. Meath, Rep. of Ireland, 26 m. NW. of An Uaimh. Pop. 650.

**Oldenbarneveldt**, Jan van (1547-1619), see BARNEVELDT.

**Oldenburg**: 1. Former grand duchy of N. Germany (after 1918 a rep.), comprising the prov. of O., around the tn of O. (see 2, below), the principality of Lübeck (N. of the state of that name), and the principality of Birkenfeld (qq.v.). The total area was 2482 sq. m., and the total pop. 582,000. O. was a constitutional ducal monarchy, hereditary in the male line. In 1180 the counts of O. and Delmenhorst (q.v.) succeeded in establishing the independence of their tns. after the downfall of Henry the Lion (q.v.). This family continued to rule O. until 1918, giving, moreover, new dynasties to Denmark, Russia, and Sweden. 2. Ger. tn in the Land of Lower Saxony, on the Hunte and the Hunte-Ems

Canal, 82 m. NW. of Hanover (q.v.). It was once the cap. of the duchy of O. It has anct walls and the former ducal palace (now a museum), and is the centre of a rich agric. region. Pop. 121,100.

**Oldfield, Anne** (1683-1730), commonly known as 'Nance,' actress, b. London. She made her début in 1700, and in 1704 played the part of Lady Betty Modish in Cibber's *Careless Husband*. She soon came to be recognised as one of the most brilliant actresses of the day. See E. Robins, *The Palmy Days of Nance Oldfield*, 1898.

**Oldfield, Josiah** (1863-1953), physician, lawyer, theologian, and fruitarian, b. Shrewsbury, educ. at Newport, Oxford, St Bartholomew's, and Lincoln's Inn. He was called to the Bar in 1892, but left legal practice to take up medicine. He qualified in 1897 and later founded the Humanitarian Hospital of St Francis, of which he was senior physician and chairman. In 1903 he took a similar post at the Lady Margaret Fruitarian Hospital. He pub. many books and pamphlets, including *Eat and Get Well*, *Eat and Keep Young*, *Healing and the Conquest of Pain*, *The Mystery of Birth*, and *The Mystery of Marriage*. He advocated the adoption of a fruitarian dietary for humane and aesthetic reasons. In 1901 O. founded the Society for the Abolition of Capital Punishment. During the First World War he raised and commanded a casualty clearing station and a field ambulance. In 1920 he was called to the Jamaican Bar.

**Oldham**, municipal, co., and parl. bor. of Lancs, England, 6 m. NE. of Manchester, incorporated as a bor. in 1849. The prin. buildings are the tn hall, the art gallery, museum, and public library, the new technical college for further education (opened 1954), and the art school. There are numerous parks and recreation grounds, and an excellent study centre. It is one of the chief centres of the cotton-spinning industry, and is noted for the manuf. of textile machinery; there are also a number of minor industries. O. is divided into 2 parl. constituencies (E. and W. O.), to each of which is added an adjoining urb. dist. Pop. 121,212.

**Oldys, William** (1696-1761), literary antiquary and miscellaneous writer, b. probably London. He became librarian to Lord Oxford, a post he retained for about 10 years, and in 1755 was appointed Norroy king of arms. Among his many works are *A Collection of Epigrams*, 1727, *Life of Sir Walter Raleigh*, 1736, and *The British Librarian*, 1737-8. He ed. the *Harleian Miscellany*, 1744-6, and compiled the *Catalogue of the Harley Library*, 1743-5. He also wrote sev. lives in the *Biographia Britannica* and *General Dictionary*. See memoir by J. Yeowell, 1862, reprinted from *Notes and Queries*.

**Olea Europaea**, see OLIVE.  
**Oleaceae**, family of dicotyledonous trees and shrubs of which *Abelophyllum*, *Chionanthus*, *Forsythia*, *Fraxinus*, *Jasminum*, *Ligustrum*, *Olea*, *Osmanthus*, *Osmarea*, *Phillyria*, and *Syringa* are genera.

**Olean**, tn of Cattaraugus co., New York, U.S.A., on Allegheny R., 60 m. SSE. of Buffalo, rich in oil and natural gas. It manufs. chemicals, clothing, machinery, metal and wood products, dairy products, feed, tiles, glass, and cutlery; there are also printing works. Pop. 22,880.

**Oleander** (*Nerium oleander*), or **Rose Bay**, handsome evergreen shrub belonging to the family Apocynaceae, with fragrant flowers, rather like carnations, of various shades of pink, red, and white; one of the most easily grown greenhouse plants. Its large, willow-like leaves when bruised have a powerful and disagreeable odour, and are poisonous to human beings and animals. The physiological effects are similar to those of digitalis. The O. was known to the Greeks as *rhododendron*, *nerion*, or *rhododaphne*. See Pliny, xvi. 20.

**Oleandra**, family Polypodiaceae, genus of evergreen tropical ferns, with creeping shoots, jointed stems, and entire, lanceolate or strap-shaped fronds. They are grown in the stovehouse in hanging baskets or on pillars and walls in a layer of sphagnum or peaty soil held in place by a wire netting. They need abundance of water from Mar. to Sept., and a temp. of about 70°. The rest of the year a temp. of 60° and moderate watering are sufficient.

**Olearia**, genus of Australasian evergreen flowering shrubs, bearing in summer a profusion of daisy-like flowers as well as ornamental foliage. *O. haastii* is the New Zealand daisy bush, and is often grown on sunny borders and rockeries, especially near the sea. *O. erubescens*, *O. insignis*, *O. gunniana*, *O. moschata*, and *O. semidentata* are garden-worthy shrubs for mild dists.

**Oleaster**, see ELAEAGNUS.

**Olefant Gas**, see ETHYLENE.

**Olefine**, in chem., a hydrocarbon of the ethylene series, having the general formula  $C_nH_{2n}$ . The simplest O. is ethylene (q.v.) itself,  $C_2H_4$ .

**Oleic Acid** (9-octadecenoic).  $CH_3(CH_2)_7CH:CH(CH_2)_7COOH$ , unsaturated fatty acid with one double bond, occurs in combination with glycerine as olein in virtually all fats and glyceride oils. It is a major component in most liquid vegetable oils and the prin. acid in palm oil, ground-nut oil, olive oil, sesame oil, and sunflower oil (q.v.). Chemically pure O. A. is a tasteless, odourless liquid at ordinary temps. and does not absorb oxygen when exposed to the air. Commercial O. A. contains varying amounts of other fatty acids and becomes rancid when exposed to air and light. It has a light straw to deep red or reddish brown colour, depending upon the degree of purity, and is sometimes described as 'Red Oil.' O. A. is prepared chiefly from split and distilled animal fatty acids by expression in hydraulic presses, or fractional crystallisation at low temp. from a solvent. Sometimes the polyunsaturated acids are polymerised, e.g. 'dimersed,' and only the unaffected oleic monomer, removed by distillation, is fractionally crystallised to produce O. A. of high purity. Prin. manuf. products in

which O. A. and its derivatives are used are: liquid and dry cleaning soaps, textile soaps, synthetic detergents, shampoos, cosmetics, liquid waxes and polishes, synthetic rubber (latex), protective coatings, lubricants, insecticides, printing inks, and foods. See FATTY ACIDS.

**Oleograph**, name given to a picture done in oil colours by a chromo-lithographic process, the print being mounted on canvas and varnished to imitate an original oil painting.

**Oleomargarine**, see MARGARINE.

**Oleosa**, see MALLEE.

**Oléron, Ile d'**, is. of the Atlantic Ocean, off the SW. coast of France, and part of the dept. of Charente-Maritime. Its maximum length is 18 m., breadth 7 m., and it covers an area of 66 sq. m. The surface is generally fertile, and it produces corn and wine. The prin. tns are St-Pierre and Le Château-d'Oléron. Pop. 14,000.

**Oléron, Judgments of**, code of maritime laws in use in W. Europe during the Middle Ages. It is said to have been originated by Eleanor of Guienne, wife of Henry II of England, towards the middle of the 12th cent., at O., part of the duchy of Aquitaine, which came into the possession of the Fr. Crown in 1370, and to have been introduced into England in the reign of Richard I, with some amendments and additions. See SEA LAWS.

**Olfactory Nerve**, see NERVOUS SYSTEM, Cranial Nerves and Nose.

**Olga**, St. (c. 879-969), wife of Igor, Prince of Kiev. On his death in 945 she ruled as regent for her son Sviatoslav. In 958 she was baptised at Constantinople, and was after her death canonised in the Gk Orthodox Church, her commemoration day being 11 July. She made great but unsuccessful efforts to introduce Christianity into Russia, a task achieved by St Vladimir, her grandson.

**Olhão**, tn of Portugal, in Faro dist., on the Atlantic coast, 5 m. E. of Faro (q.v.). It has noted sardine fisheries and canneries, and salt works. Pop. 14,500.

**Oliaros**, see ANTIPAROS.

**Olibanum** (Gk *libanos*, frankincense), gum-resin yielded by various species of the genus *Boswellia*, found in Somaliland.

**Oligarchy** (Gk *oligarchia*), 'the government of the few,' the constitution amongst the anc. Greeks where a portion of the community were in possession of power, e.g. the govts. of Thebes, Megara, and Corinth. In anc. times, although it was acknowledged that an 'aristocracy' often developed into an O., the 2 were distinguished, 'O.' signifying the gov. of the wealthy, who were looked upon as directing their efforts towards their own aggrandisement and the maintenance of their own power and privileges, while 'aristocracy' meant the rule of the best people for the public good. See ARISTOCRACY.

**Oligocene System**, geological strata laid down in an epoch which elapsed between Eocene and Miocene time. In Britain the O. formations are only met with in the Hants basin, where they consist of thin-bedded sandstones, clays, marls, and

limestones, known collectively as a fluvio-marine series. They are subdivided into the Heaton, Osborne, Bembridge, and Hamstead beds. The subdivs., lower, middle, and upper, of the O. in France, Belgium, Switzerland, and N. Italy, have been named after places of typical development, as Tongrian (from Tongres), Stampian (after Etampes), and Aquitanian (Aquitania) respectively. In the Paris basin the system is represented by lacustrine marls with the gypsum of Montmartre forming the lower O., followed by lacustrine and marine marls. The highest beds are the sandstones of Fontainebleau and the fresh-water limestones of Orleans (Beauce). The Ger. O. are remarkable for their deposits of lignite and brown coal. In N. America the Vicksburg beds (orbitolitic) occurring in Alabama and Florida, the White River beds of S. Dakota, and the Red Bluff of the Mississippi dist., are of O. age.

**Oliphant, Laurence** (1829-88), Brit. journalist and travel writer, b. Cape Town. He studied law and was called to the Bar, but spent the first 38 years of his life in desultory study and travels which embraced America, China, and Japan. He was in the Crimean War and the Indian Mutiny, and served as private secretary to Lord Elgin when he was Governor-General of Canada. In 1865 he was elected M.P. for Stirling Burghs and in 1870 he was correspondent for *The Times* in the Franco-Ger. war. A voluminous and versatile writer, he pub. many books, including *Journey to Khatmandu*, 1852, *The Russian Shores of the Black Sea*, 1853, *Minnesota and the Far West*, 1855, *Patriots and Filibusters*, 1860, and *Piccadilly: a Fragment of a Contemporary Biography*, 1870. *Altiora Peto*, 1883, is a novel, *Episodes in a Life of Adventure*, 1887, is autobiographical, and *Scientific Religion*, 1888, embodies mystical views which he later adopted. His life was written by his cousin Margaret O. (q.v.). See also L. F. Leesching, *Personal Reminiscences of Laurence Oliphant*, 1891, and H. W. Schneider and G. Lawton, *A Prophet and a Pilgrim*, 1942.

**Oliphant, Marcus Laurence Elwin** (1901- ), Australian physicist, b. Adelaide, educ. Adelaide Univ. and Trinity College, Cambridge. O. was appointed Messel research fellow of the Royal Society, 1931; fellow and lecturer, St John's College, Cambridge, 1934; assistant director of research, Cavendish Laboratory, Cambridge, 1935; prof. of physics, univ. of Birmingham, 1937-50; and since 1950 director of the research school of physical sciences at the Australian National Univ. His work in nuclear physics, and particularly his contribution to the development of atomic energy, is of outstanding importance in the hist. of science. O. has pub. papers on electricity in gases, surface properties, and nuclear physics.

**Oliphant, Margaret, née Wilson** (1828-1897), authoress, b. Wallyford, near Musselburgh. She produced her first novel, *Passages in the Life of Mrs Margaret Mailland*, in 1849, following this with *Caleb Field* and *Merkland* in 1851.

The last named met with such great success that on coming to London in 1852 she was invited to write for *Blackwood's Magazine*, contributing from that date until her death over 200 stories and articles. She wrote *Katie Stewart*, 1853, *Quiet Heart*, 1854, *Zaidee*, 1856, and *The Athelings*, 1857. Previous to this, she had, in 1852, married her cousin, Frank Wilson O., who was an artist in stained glass. She wrote in all about 100 books, the best known of which are the novels *Memoirs and Resolutions of Adam Graeme of Mossgray*, 1852, *Miss Marjoribanks*, 1866, *White Ladies*, 1875, *Effe Ogilvie*, 1886, and *The Marriage of Elinor*, 1892; also her biographies of R. B. Sheridan, 1883, Edward Irving, 1886, and Laurence O., 1891. See A. L. Coghill, *The Autobiography and Letters of Mrs Oliphant*, 1899, and Lady Anne Ritchie, *From the Porch*, 1913.

**Olisipo**, see LISBON.

**Oliva**, Sp. tn in the prov. of Valencia, near the Mediterranean coast. It has an auct. palace, and manufs. linen. Pop. 12,500.

**Olivarez, Gaspar de Guzman, Count of** (1587-1645), Sp. statesman, b. Rome. He became grand chamberlain to Philip IV, and from 1621 to 1642 was the real ruler of Spain. His foreign policy involved Spain in a series of disastrous wars, while at home his fiscal policy resulted in crushing taxation. O. was overthrown and exiled in 1642.

**Olive** (*Olea europaea*), slow-growing tree, with undivided leaves and axillary clusters of green flowers followed by pendulous, lustrous, blue-black oily fruits. While green and unripe, the fruits are bottled or pickled in brine. O. oil is extracted by pressure from ripe fruit. The tree has been cultivated since a remote period, especially on the borders of the Mediterranean Sea, and the cultivated forms exhibit great improvement in the size and oiliness of the fruits compared with the tree in its wild state. The wood is soft, but takes a high polish, and is used for making small, fancy articles.

**Olive Branch Petition**, final effort made by the Amer. colonists in 1775 to conciliate the Eng. Gov., after the outbreak of hostilities in the War of Amer. Independence. The petition was not allowed to be presented, and the only answer given to the appeal was a large increase of land and sea forces and a declaration in Parliament to take stern measures against the 'conspirators and insurgents' in America.

**Olive Oil**, fixed oil expressed from the fruit of the olive-tree, *Olea europaea*, of the natural order Oleaceae. The olive-tree has been cultivated from the earliest times in Greece, Italy, S. Spain, Asia Minor, and other Mediterranean countries, and has been introduced into Mexico, Chile, Peru, the S. states of America, Australia, China, S. Africa, etc., though the chief supply of the oil still comes from the Mediterranean coasts. The fruit is pressed to a pasty consistency, enclosed in woollen bags, and subjected to considerable pressure. This yields oil of the first quality; second and third grades are

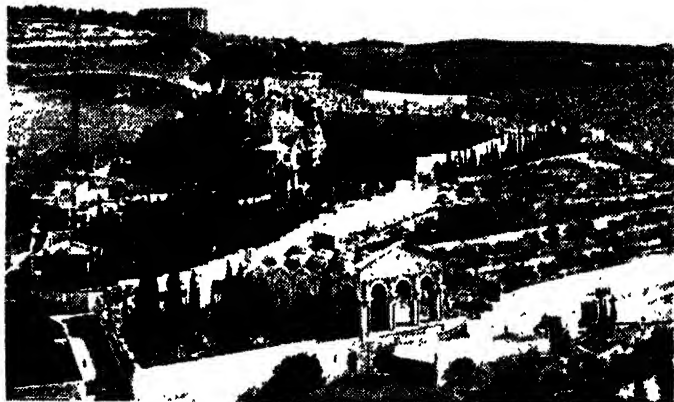
yielded by subsequent pressings. O. O. is considered to be the finest of the edible oils and, in contrast to other vegetable oils, it is generally consumed as a food without refining or further processing. It is also used in the manuf. of cosmetics, pomades, 'castile' and other kinds of soaps, and in the combing process of the textile industry. Main fatty acids are—saturated: Palmitic (9–20 per cent); unsaturated: Oleic (64–85 per cent).

**Oliveira Martins, Joaquim Pedro de** (1845–94), Portuguese historian, b. Lisbon. Elected to Parliament in 1886, he held a succession of posts in the gov., including that of finance minister in the crisis of 1892, but resigned in the same year. His

his works are the portraits of James I and his family, Sir Philip Sidney, and the family of Sir Kenelm Digby.

**Oliver, Peter** (1594–1648), miniature painter, worked like his father Isaac O. (q.v.) in the style of Nicolas Hilliard. One of his celebrated miniatures is 'The Entombment,' begun by his father. He made copies in water-colour of old masters, some of which are at Windsor Castle. There are many fine portrait miniatures by him in private collections.

**Olives, Mount of**, called also **Mt Olivet**, is only once mentioned by this name in the O.T. (Zech. xlv. 4), though it is elsewhere spoken of under other titles. The Arabic name is *Jebel al-Tur*. It is situated to the



THE MOUNT OF OLIVES

many works include *Historia da Civilisação Iberica* (trans. *A History of Iberian Civilisation*), 1879, *Historia de Portugal*, 1879, *O Brazil e as Colonias portuguezas*, 1880, *Historia de Republica Romana*, 1885, and *Os filhos de João I* (trans. *The Golden Age of Prince Henry the Navigator*), 1891.

**Oliveinite**, olive-green coloured hydrous arsenate of copper with phosphorus. It occurs in orthorhombic prisms, but is also found fibrous and globular or earthy (h. = 3, sp. gr. = 4.4). Crystalline O. is found in Cornwall and Devon, and at Alston Moor in Cumberland. It has a vitreous lustre and breaks with a conchoidal fracture. The fibrous variety is also called wood-copper or wood-arsenate.

**Oliver**, see **ROLAND**.

**Oliver, George**, see **ONIONS**. **GEORGE O. Oliver, Isaac** (c. 1556–1617), miniature painter, probably b. in England, and, though of Fr. origin, regarded by his contemporaries as an Englishman. He painted many portraits, and was exceedingly expert in his miniatures. Among

E. of Jerusalem, from which it is separated by the valley of the Kidron or valley of Jehosaphat. The name is frequently applied to the range of hills of which it is one. To its N. is the Scopus, the site of the encampment of the Romans under Titus. The 'Prophets' is a hill to the S. of Olivet proper, and the outlying spur of the range to the S. is known as the Mt of Offence. The M. of O. is connected intimately with the life of Jesus, for on the W. slope lay the Garden of Gethsemane. The M. of O. is 2680 ft above sea level, and on its summit are many churches and convents, the most ancient being the small octagonal church of the Ascension (5th cent.). Others are the Orthodox convent of Galilee; a modern Russian convent with a conspicuous view-tower; and the church of the Paternoster, this last being a Ger. Protestant hospice built by William II in 1910, and used as the gov. house by the Palestine administration up to 1927, when an earthquake rendered it uninhabitable. The Heb. Univ. was inaugurated here in 1925. Scopus is



controlled by Israel, but the univ. buildings have been disused since 1948. The rest of the range forms part of Jordan.

**Olivier, Sir Laurence Kerr** (1907- ), actor, producer, and manager, b. Dorking, son of the Rev. G. K. O. He was educ. at St Edward's School, Oxford. First appeared on the public stage as Katherine in *The Taming of the Shrew* in a special boys' performance at the 1922 Stratford Shakespeare Festival. In the next 7 years he toured plays and sketches with Ruby Miller and Lena



Karsh, Ottawa

SIR LAURENCE OLIVIER

Ashwell, and spent 3 years in the Birmingham Repertory Co. His performance for the Stage Society as Stanhope in *Journey's End* heralded his long line of professional leading parts, the most celebrated of which have been Hamlet (Old Vic, 1937), Romeo (1939), Richard III (1948), and Macbeth and Titus (Stratford, 1955). Modern plays include *Venus Observed*, *The Sleeping Prince*, and *The Entertainer*. He has played in America, toured the Continent (1945), and Australia (1948). He has acted in many films (*Wuthering Heights*, *Pride and Prejudice*, etc.) and also produced and directed the film versions of *Henry V*, *Hamlet*, and *Richard III*, in which he played the leading parts. In 1930 he married Jill Esmond, who obtained a divorce in 1940; his second wife, Vivien Leigh (q.v.), played Juliet to his Romeo in his 1939

production. During the Second World War he was a lieutenant in the Fleet Air Arm, but was released in 1944 to co-direct the Old Vic Theatre Co. (q.v.). He was knighted in 1947.

**Olivier of Ramsden, Sydney Haldane Olivier, 1st Baron** (1859-1943), statesman, colonial administrator, and writer; educ. at Lausanne, Tonbridge school, and Corpus Christi College, Oxford. He entered the Colonial Office in 1882, and thereafter held a succession of important posts: secretary to the W. India Royal Commission, 1897; colonial secretary, Jamaica, 1899-1904; governor of Jamaica, 1907-13; permanent secretary of the Board of Agriculture, 1913-17. He was created baron in 1924. He took office as secretary of state for India, 1924, under the first Labour gov. O. was secretary of the Fabian Society from 1886 to 1890, and held what were then considered advanced views, especially on colonial policy. Among his publs. were *White Capital and Coloured Labour*, 1906, *The Anatomy of African Misery*, 1927, *The Myth of Governor Eyre*, 1933, and *Jamaica, the Blessed Isle*, 1936, a standard work. See *Sydney Olivier: Letters and Selected Writings*, with a memoir by Margaret O., 1948.

**Olivine**, see CHRYSOLEITE and IGNEOUS ROCKS.

**Oliwa**, vil. of Poland, in Gdańsk prov., 5 m. NW. of Gdańsk (q.v.). It has a cathedral of the Bishop of Gdańsk. At the Peace of O. in 1660 the rights of the kings of Poland in Sweden and Prussia were regulated.

**Olla Podrida** (literally 'putrid pot'), so called from its miscellaneous contents, is a stew made of meat, fish, poultry, vegetables, and other ingredients, very common in Spain. It is cooked in a closed pot, and is always very highly seasoned with pepper and garlic. Compare the Fr. *pot pourri* and the Scottish hotch-potch.

**Ollenhauer, Erich** (1901- ). Ger. politician, educ. at elementary and commercial schools. He became an active Socialist at the age of 15, joining the Social Democrats (S.P.D.) in 1918. He went to Czechoslovakia and conducted anti-Nazi propaganda from there, being deprived of Ger. citizenship in 1935. He took refuge in France (1938-41) and Britain (1941-6). After the Second World War he returned to Germany, and succeeded Schumacher (q.v.) as chairman of the Social Democrats in 1952, carrying on Schumacher's anti-Ger. rearmament policy.

**Olmütz**, see OLOMOUC.

**Olmütz, Convention of**, Austro-Prussian agreement of 1850, by which, after the upheavals of 1848-9, the influence of Austria in Germany was revived, at the expense of Prussia. To the latter the convention was known as 'the humiliation of O.'

**Olney, Richard** (1835-1917), Amer. statesman and lawyer, b. Oxford, Massachusetts. In 1893 he was attorney-general of the U.S.A. In 1895 he became secretary of state in President Cleveland's Cabinet. He drafted the famous message

of 1895, insisting that Great Britain must submit to arbitration the long-standing boundary dispute between Venezuela and Brit. Guiana. O. retired in 1897.

**Olney**, tn of Bucks, England, on the Ouse, 59 m. from London. Wm Cowper, the poet, was a resident from 1767 to 1786, and the house he lived in, containing various relics, is still extant. A famous pancake race for women, begun in 1445, is held at O. annually on Shrove Tuesday. Pop. 2700.

**Olomouc**: 1. Region (*kraj*) in N. central Czechoslovakia, part of the former prov. of Moravia (q.v.) and including some dists. of Silesia (q.v.). It is watered by the Morava (q.v.), and contains part of the Sudetic Mts (q.v.). Area 2395 sq. m.; pop. 585,000.

2. (Ger. *Olmutz*) Czechoslovak tn, cap. of the region of O., on the Morava. Until 1640 it was the cap. of Moravia. It is a picturesque tn, is the seat of an archbishop, and has many fine buildings, including a Gothic cathedral and a 16th-cent. tn hall. It has a univ. (1576) with a notable library. There are iron, steel, engineering, and textile industries. Pop. 58,700.

**Olonos**, see *ERYMANTHUS*.

**Oloron** (-*Sainte-Marie*), Fr. tn, cap. of an arron., in the dept of Basses-Pyrénées, at the confluence of the Aspe and the Ossau. The former cathedral of Ste-Marie is partly 12th cent. There are textile and leather industries. Pop. 10,600.

**Olsen**, Björn M. (1850-1919), Icelandic scholar who wrote extensively on Old Icelandic literature. See P. E. Ólasen, *Íslenskar æfiskrár*, and H. Hermannsson's *Catalogues of the Fiske Icelandic Collection*.

**Olztyń**: 1. Prov. (*województwo*) of N.E. Poland, bordering in the N. on the U.S.S.R., and in the NW. on the Baltic Sea. It is generally low-lying, is well wooded, and has numerous lakes, particularly in the E. (the Masurian Lakes). Until 1945 it was part of E. Prussia (q.v.). Livestock is raised, and cereals and potatoes are grown. The fishing and timber industries are important. Area 8105 sq. m.; pop. 500,000. See *MASURIA*.

2. (Ger. *Allenstein*). City of Poland, cap. of O. prov., on the Lyna, 105 m. N. by W. of Warsaw (q.v.). It was founded in 1348 by the Teutonic Knights (q.v.). It went to Poland in 1466, and to Prussia in 1772. It was retained by Germany after plebiscite in 1920. After the Second World War the Ger. pop. left. It is the seat of a bishop, is a health resort and mkt tn, and has a power station. Pop. 33,000.

**Olten**, tn of Switzerland, in the canton of Solothurn, on the R. Aar. It is a railway junction, with workshops, and has manufs. of iron, wire, linen, cotton, and shoes. It is the centre of book-trade supply for the publishers of Switzerland. Pop. (1957) 18,600.

**Oltenița**, tn of Rumania, 35 m. SE. of Bucharest, on the l. b. of the Danube, at the confluence of the Argeș. It is a riv. port. Pop. (1930) 10,400.

**Oltis**, see *LOT*.

**Oltis Missoc**, see *BIWA LAKE*.

**Oltul**, see *ALUTA*.

**Olympia**: 1. Name given to a plain which contained the temple and sacred grove of Zeus Olympius, situated in the Peloponnesian dist. Pisatis, belonging to the Eleans, at the confluence of the Cladeus and the Alpheus. It was of great importance from very early times. Besides the temple of Zeus Olympius, there were sev. sacred edifices and other public buildings in the sacred grove and its immediate neighbourhood. The grove itself (called *Altis*), which is described by Pindar as being well wooded, was bounded on the W. by the Cladeus, on the S. by the Alpheus, and on the E. by the Stadium. In the centre was a grove of planes, and the whole Altis was surrounded by a wall (said to be the work of Heracles) in which were sev. gates; the most important being the Pompe Entrance in the middle of the W. side, through which all the processions passed. To the right of this entrance stood the Olympieum, or temple of Zeus Olympius, a magnificent building, designed by the architect Libon of Elis, and second only to the Parthenon. The temple contained the 'Callistephanus,' or wild olive tree, which furnished the garlands of the Olympic victors. In front of the Heraeum and Pelopium, and equidistant from both, was the Great Altar of Zeus (22 ft high), and between the altar and the temple of Zeus stood the Column of Oenomaus. Besides those already mentioned there were the stadium and the hippodrome. These two formed the place of exhibition for all the Olympic contests, and probably formed a continuous area from the circular end of the stadium to the further extremity of the hippodrome. The stadium, which was about 210 yds long, was used chiefly for foot races, and had 2 entrances, the Pompe and the Secret. The latter being only used by the Hellanodici or judges, while the hippodrome was used for chariot races and horse races. See E. N. Gardiner, *Olympia, Its History and Remains*, 1925.

2. City, cap. of the state of Washington, U.S.A., on Budds Inlet about 50 m. from Seattle. It is a seaport and port of entry, and the seat of St Martin's College. It contains the capitol, a magnificent edifice built in native sandstone, in which is the state library. The chief industry is lumbering, but fishing and mining are also carried on, and the manuf. of metal products, farm machinery, and canning equipment. Water power is supplied from the Deschutes R. Pop. 15,819.

**Olympia**, glass-domed exhibition hall in the dist. of W. Kensington, bor. of Hammersmith, London. It was opened in 1886 and enlarged in 1923 and 1929. The exhibitions and trade shows regularly held here are the Christmas circus and fair, Cruft's Dog Show, the Ideal Home Exhibition, British Industries Fair, and the Dairy Show.

**Olympiad**, period of 4 years between each celebration of the Olympic Games. 776 BC was reputed to be the first year of the first O. O.s began to be reckoned

from the victory of Coroebus (776 BC), the first victor in the games after their suspension for 86 years; but Timæus of Sicily, who fl. 264 BC, was the first writer who regularly arranged events according to the conquerors in each O. His practice was followed by Polybius, Diodorus Siculus, Dionysius of Halicarnassus, and others; but the last O. ended AD 394, for the Olympic Games were abolished in that year during the reign of Theodosius the Great. For converting O.s into years BC, multiply the number of O.s that have actually elapsed by 4, and deduct the number thus obtained from 780. For converting O.s into years AD, go through the same process as before, but subtract 780 from the number obtained by multiplication. But seeing that the Olympic Games (q.v.) were celebrated about midsummer, and that the Attic year began at about the same time, it is necessary to reduce the year BC by one if an event happened in the second half of the year. The method of calculation by O.s was, however, only used for literary purposes, and never adopted in everyday life.

Olympias (d. 316 BC), wife of Philip II of Macedonia, and the mother of Alexander the Great, was the daughter of Neoptolemus I, King of Epirus. Philip, on account of disagreements, separated from her and married Cleopatra. She left him to live with her brother Alexander, King of Epirus, whence she contrived the death of her husband. She returned to Macedonia on the accession of her son Alexander; but during his absence she caused great trouble to the regent Antipater, and on the death of her son in 323 BC was forced to retire again to Epirus. Here she remained until 317, when she became for a short time mistress of Macedonia; but she was forced to surrender eventually to Cassander, Antipater's son, and being condemned without a hearing, was put to death in 316 BC. See G. A. Macurdy, *Hellenistic Queens*, 1932.

**Olympic Games.** *The Ancient Greek Games.* The O. (or Olympian) G., the chief national festival of the Greeks, were held once every 4 years, and were celebrated in honour of Zeus. They occupied 5 days, and consisted of 2 parts: the presentation of offerings and the contests. At first the contest consisted of a simple running match held in the stadium, but about 724 BC the *diavulos*, or double course, was introduced, in which the runners had to make a circuit of the goal and return to the starting-point. Later came the *dolichos*, or long race, and in 708 BC the *pentathlon* was introduced, a five-fold contest, consisting of leaping, running, throwing the quoit, wrestling, and throwing the javelin. Wrestling and boxing, too, were combined in the *pankration* (648). In 680 chariot racing in the hippodrome was introduced, and though this was twice as long as the stadium, it had to be traversed about 10 times in both directions (at first with 4 horses, after 500 with mules, and after 408 with 2 horses). There were also races in armour, and those in which the horsemen had to

leap from their horses and run beside them with the bridles in their hands, besides competitions between heralds and trumpeters. The contests were open to all freemen of pure Hellenic descent who had not incurred any personal disgrace, but all barbarians and slaves were excluded. (The Romans, not being reckoned barbarians, were allowed to take part.) Women, too, were excluded, and were not even allowed to watch the games, there being but one exception, the priestess of Demeter. The supervision of the contests was in the hands of the Hellenodici, who were appointed by popular election from the Eleans themselves. At the end of the contests a sacrifice was made by the victors wearing their crowns, and a banquet was held in the Prytaneum of the Altis, during which a song of victory, composed by an eminent poet, was chanted by choral bands. Authors, poets, orators, and artists also used the opportunity afforded by the assembling of so vast a crowd to make themselves known by the recital and exhibition of their works.

*The Modern Olympic Games.* The revival of the O. G. was due to the energy and persistence of the Frenchman, the Baron Pierre de Coubertin, who, with the support of C. Herbert of the Eng. Amateur Athletic Association and W. M. Sloane of the Amer. Athletic Union, initiated an international congress at which France, Great Britain, U.S.A., Sweden, Italy, Spain, Greece, Russia, and Belgium were represented. The congress met at the Sorbonne in June 1894, and the International O. G. Committee was appointed with Baron de Coubertin as president. The first modern Olympiad was held at Athens in 1896, and it was decided to hold the games every 4 years in parts of the world to be chosen by the Olympic Committee, but, to satisfy Gk sentiment, an intermediate minor Olympic was held at Athens in 1906. The second Olympiad was celebrated at Paris in 1900, but the games did not yet create a world-wide interest. The third Olympiad (1904) at St Louis, U.S.A., was, like its predecessors, distinguished by Amer. successes, but several nations, including Great Britain, were unable to send teams. The first well-represented Olympiad was the fourth Olympiad, held at London in 1908. In this Olympiad weight-lifting, polo, lawn-tennis (omitted after 1924), and Association football (omitted after 1928) were introduced. Cycling, rowing, gymnastics, and wrestling, omitted since 1896, were revived. Rugby football was also included, but dropped in 1928. Swimming and hockey are two other popular events, nor must the literary, artistic, and musical competitions be forgotten. The fifth Olympiad was held at Stockholm in 1912, but the sixth Olympiad, to be held at Berlin, did not take place owing to the First World War. The seventh Olympiad was held at Antwerp and the eighth at Paris, where the Finn, Nurmi, distinguished himself. The ninth Olympiad at Amsterdam in 1928 saw the return of a Ger. team, excluded since the First World War, and also the introduction of athletic

events for women. Britain and the dominions had their most successful post-war team, while America again dominated in the field events. Nine Olympic records were made in 1928. The tenth was held at Los Angeles in 1932, and the eleventh at Berlin in 1936. This latter was used as a propaganda display for the National-Socialist regime, and there were expressions of racial prejudice when Negroes won some of the events. The twelfth and thirteenth Olympiads did not take place

10,000 metres, and marathon within 8 days. In Melbourne B. Morrow (U.S.A.), V. Kuts (U.S.S.R.), and Betty Cuthbert (Australia) all won 2 individual track titles. Following the example of previous O. G. there was a spate of new athletic records at Melbourne. In the men's events 18 out of 24 were improved upon, and all 9 were either equalled or beaten in the women's competitions. Australia proved the new leaders in swimming by winning 8 titles. Although the U.S.A.



*Sport and General*

#### THE OLYMPIC GAMES, MELBOURNE, 1956

The 5000 metres final, showing the winner, V. Kutz (Russia) leading from G. Pirie (G.B.), who was second, and A. Thomas (Australia), who came fifth.

owing to the Second World War and the next was staged in London in 1948. By this time the 17 sports were stabilised as: athletics, modern pentathlon, basketball, boxing, canoeing, cycling, fencing, gymnastics, field hockey, rowing, swimming, shooting, weight-lifting, wrestling, equestrianism, football, and yachting. Helsinki staged the fifteenth Olympiad in 1952, and the sixteenth, in 1956, was held in the S. hemisphere at Melbourne for the first time. Owing to Australian quarantine laws the equestrian events could not be held in Melbourne, and so were staged at Stockholm; the Winter O. G. were held in 1956 at Cortina.

At Helsinki the U.S.S.R. entered the O. G. for the first time in hist. The most distinguished competitor was E. Zatopek, Czechoslovakia, who won the 5000 metres,

lost ground in swimming. Americans dominated the men's athletics more than at any time in Olympic hist., winning 15 events. At Helsinki Britain's Olympic successes were confined to 1 gold medal in the equestrian events, but in 1956 Brit. competitors won 6 gold medals in the following sports: equestrian, athletics, swimming, fencing, and boxing (2).

The Olympic athletic records following the 1956 O. G. at Melbourne were as follows:

MEN: 100 metres, 10.3 sec., E. Tolan, 1932; J. C. Owens, 1936; H. W. Dillard, 1948; I. Murchinson, B. J. Morrow, 1956 (all U.S.A.). 200 metres, 20.6 sec., B. J. Morrow (U.S.A.), 1956. 400 metres, 45.9 sec., V. G. Rhoden (Jamaica), H. H. McKenley (Jamaica), 1952. 800 metres, 1 min. 47.7 sec., T. W. Courtney

(U.S.A.), 1956. 1500 metres, 3 min. 41.2 sec., R. Delany (Ireland), 1956. 5000 metres, 13 min. 39.6 sec., V. Kuts (U.S.S.R.), 1956. 10,000 metres, 28 min. 45.6 sec., V. Kuts (U.S.S.R.), 1956. Marathon, 2hrs 23 min. 03.2 sec., E. Zatopek (Czechoslovakia), 1952. 4 x 100 metres relay, 39.5 sec., U.S.A., 1956. 4 x 400 metres relay, 3 min. 3.9 sec., Jamaica, 1952. 20 kilometres walk, 1 hr 31 min. 27.4 sec., L. Spirin (U.S.S.R.), 1956. 50 kilometres walk, 4 hrs 28 min 07.8 sec., G. Dordoni (Italy), 1952. 110 metres hurdles, 13.5 sec., L. Q. Calhoun (U.S.A.), J. W. Davis (U.S.A.), 1956. 400 metres hurdles, 50.1 sec., G. A. Davis (U.S.A.), E. Southern (U.S.A.), 1956. 3000 metres steeplechase, 8 min 41.2 sec., C. Brasher (Great Britain), 1956. High jump, 6ft 11 in., C. W. Dumas (U.S.A.), 1956. Pole vault, 14 ft 11 in., R. E. Richards (U.S.A.), 1956. Long jump, 26 ft 5 in., J. C. Owens (U.S.A.), 1936. Hop, step and jump, 53 ft 7 in., A. F. da Silva (Brazil), 1956. Shot putt, 60 ft 11 in., W. P. O'Brien (U.S.A.), 1956. Discus, 184 ft 10 in., A. Oerter (U.S.A.), 1956. Hammer, 207 ft 3 in., H. Connolly (U.S.A.), 1956. Javelin, 281 ft 2 in., E. Danielsen (Norway), 1956. Decathlon, 7971 points, M. Campbell (U.S.A.), 1956.

WOMEN: 100 metres, 11 sec., B. Cuthbert (Australia), 1956. 200 metres, 23.4 sec., M. Jackson (Australia), 1952; B. Cuthbert (Australia), 1956. 4 x 100 metres relay, 44.5 sec. (Australia), 1956. 80 metres hurdles, 10.7 sec., S. B. Strickland de la Hunt (Australia), 1956. High jump, 5 ft 9 in., M. McDaniel (U.S.A.), 1956. Long jump, 20 ft 9 in., E. Krzesinska (Poland), 1956. Shot putt, 54 ft 5 in., T. A. Tishkevich (U.S.S.R.), 1956. Discus, 176 ft 1 in., O. Fikotova (Czechoslovakia), 1956. Javelin, 176 ft 8 in., I. Yaunzeme (U.S.S.R.), 1956.

The seventeenth Olympiad is due to take place at Rome in 1960.

The Games are controlled by the International Olympic Committee, on which more than 70 nations are represented. The equipping of each team is the work of the national committee, i.e. in Great Britain of the Brit. Olympic Association. See also **ATHLETICS**. See F. A. M. Webster, *The Evolution of Olympic Games*, 1914, and *Olympic Cavalcade*, 1948, and H. Abrahams, *The Olympic Games Book*, 1956.

**Olympiodorus**, name of 2 philosophers of the Neoplatonic school, natives of Alexandria. O. the elder (5th cent. AD) was teacher of Proclus. Of the writings of O. the younger (6th cent. AD) are extant a life of Plato, an attack on Strabo, and scholia on the *Phaedo*, *Alcibiades I*, *Philebus*, and *Gorgias*.

**Olympus**, anct name of sev. chains of mts. The most famous (now called Elymbo) was on the frontiers of Thessaly and Macedonia. Its highest peak is 9754 ft, and is snow-capped for 9 months of the year. O. was regarded by the Greeks as the abode of the gods, and as having the palace of Zeus at its summit.

**Olynthus**, anct tn of Chalcidice, and

the most important of the Gk cities on the coast of Macedonia. It was at the head of a confederacy of all the Gk tns in its neighbourhood, and maintained its independence, except for a short interval when it was subject to Sparta, till it was taken and destroyed by Philip (347 BC). The Olynthiac orations of Demosthenes urged the Athenians to send assistance to the city when it was attacked by Philip.

**Omacatl**, Aztec god of joy and festivity (the name signifies 'two reed'). He was worshipped only by those who came under his direct influence, i.e. the rich who could render homage to him in splendid banquets. The idea of communion which appears to have instigated the religious feasts of the Mexicans was apparently present in these banquets to the Mexican Bacchus. O. is one of the manifestations of the Gk deity Tezcatlipoca.

**Omagh**, mrkt tn and cap. of co. Tyrone, N. Ireland, on the Strule, situated among the foothills of the Sperrin Mts. Its castle (now in ruins) was besieged in 1509 and 1641. The chief buildings are the twin-spired Catholic church, the Church of Ireland, and the Courthouse. Industries include corn-milling, milk-processing, and shirt manuf. Pop. 6800.

**Omaha**, co. seat of Douglas co., and chief commercial city of the state of Nebraska, U.S.A., is on the r. b. of the Missouri R., 20 m. N. of the mouth of the Nebraska R. The city is well built on the sloping banks of the riv., and has many fine edifices. It is an important shipping, transportation, and industrial centre, served by railroads, transcontinental airlines, and bus lines. It is a port of entry. Industries include oil refining, lead smelting, and meat packing, and the manuf. of farm implements, mechanical appliances, paint, boxes, beverages, flour, and cereal and dairy products. The municipal airport and Offcut Air Force Base are here. Educational institutions include Creighton Univ., Univ. of Nebraska College of Medicine, O. Municipal Univ., Duchesne College, College of St Mary, the Grace Bible Institute, and the state school for the deaf. Pop. 251,117.

**Omaha Beach**, ood name of the stretch of beach from the Vire R. to Port-en-Bessin, where the U.S. 5th Corps landed on D-Day 1944, in the Second World War.

**Omahas**, tribe of N. Amer. Indians, now living chiefly in E. Nebraska and numbering about 1800. They are of Sioux stock.

**Oman, Carola Mary Anima** (1897-), biographer and novelist, b. Oxford, daughter of Sir Charles O. (q.v.). During the First World War she was a nurse in France, and in 1922 she married Sir Gerald Lenanton. She is best known for her historical biographies, especially *Nelson*, 1947, which won the *Sunday Times* prize, and *Sir John Moore*, 1953, which won the Tait Black Memorial prize; others are *Prince Charles Edward*, 1936, and *Henrietta Maria*, 1936, also *David Garrick*, a 2-vol. study, 1958. She has

written a number of historical novels, including *The Road Royal*, 1924, *Princess Amelia*, 1924, *Crouchback*, 1929, *The Empress*, 1932, *The Best of his Family*, 1933, and *Over the Water*, 1935; with these may be grouped her excellent children's books, *Alfred, King of the English*, 1939, and *Robin Hood*, 1949. Among her novels of modern times are *The Holiday*, 1928, *Fair Stood the Wind*, 1930, *Nothing to Report*, 1940, and *Somewhere in England*, 1943. *The Menin Road*, 1919, is a vol. of poems.

**Oman**, Sir Charles William Chadwick (1860-1946), historian, b. Muzaffarpur, India. In 1883 he was made a fellow of All Souls College, in 1905 a member of the Brit. Academy and Chichele prof. of modern hist. at Oxford, retiring from the latter post in 1946. Conservative M.P., Oxford Univ., 1919-35, he was made K.B.E. in 1920. A specialist in military hist., among his writings are *A History of the Art of War in the Middle Ages*, 1898, 1924, *A History of the Peninsular War*, 1902-11, a work of the greatest authority, *A History of England before the Norman Conquest*, 1910, *Napoleonic Studies*, 1929, *A History of the Art of War in the Sixteenth Century*, 1937, and *On the Writing of History*, 1939. His daughter Carola (q.v.) is also a historian, especially known for her life of Nelson, 1947.

**Oman** (and Muscat), sultanate in the extreme E. of Arabia between the Gulf of O. and the ocean on one side and the Rub' al-Khali desert on the other; the coastline stretches from near Cape Masandam at the head of the gulf to a point near meridian 54 E. on the S. coast, though the 300 m. or so between O. proper and the prov. of Dhofar are desert. Area 82,000 sq. m.; pop. 550,000. A range of mts runs the length of the country, 10,000 ft at the highest point, and in most places falling steeply to the sea. W. of the range is the quicksand Umm al-Samim, perhaps 95 m. by 40 m., a sump which collects any drainage there may be. The Batina plain N. of Muscat is very fertile, though the rest of the country is mt or desert with many oases. Dhofar is fertile but very small.

Hist. begins with the Muslim conquest. The caliphs found it hard to rule O. effectively; the name of Mohammad ibn Thaur, who led a punitive expedition in AD 894, is still execrated for the atrocities he committed. From 1009 O. was independent, and Persians devastated much of it in 1265. In 1508 the Portuguese seized the ports, but by 1614 only Muscat, Matrah, and the citadel of Sohar remained in their hands. In 1698 O. seized Mom-basa and other places on the E. coast of Africa. From 1711 to 1742 there was anarchy, one party calling in the Persians who stayed from 1737 to 1741; one result was the rise of the present reigning family. In 1798 the first treaty with Britain was made and shortly after tribute was paid to the Wahhabis. In 1854 O. was driven out of Bunder Abbas and some other places on the Persian coast, and 2 years later Zanzibar broke away and became an independent state under a member of the reigning family. At the present time, a

man who calls himself the imam rules the interior, ignoring the sultan in Muscat. This summary gives only a faint idea of the ceaseless strife which makes up the hist. of O. The pop. is believed to consist of both S. and N. Arabs who are at daggers drawn; for cents. the parties have been called Hinawi and Ghafiri, and a vil. may contain both parties. In addition, the N. is orthodox Sunnite and the S. Ibadhi, i.e. heretical. The chief products are dates, sugar-cane, and fruit; the pearl fishery is not so important as it was. Trade is mostly in the hands of Indians, the chief imports being rice, sugar, and coffee; there are no industries of any importance. The chief tns are Muscat (q.v.) and Matrah. A new treaty of commerce and navigation was made with Britain in 1939. See also ARABIA. See Bertram Thomas, *Arabia Felix*, 1932, and J. Morris, *Sultan in Oman*, 1957.

**Oman**, Gulf of, extension of the Arabian Sea to the NW., between Mukran (Persia) and O. It leads to the Persian Gulf through the strait of Ormuz, and has a width of 200 m. at its entrance.

**Oman**, Trucial, stretches the 325 m. between Cape Masandam and Qatar on the S. shore of the Persian Gulf. In 1853 an agreement was made between 5 small states and Britain to observe peace at sea; the previous name Pirate Coast gives the reason for the agreement. The original 5 are now 7, for one has split into 3; they are, from W. to E., Abu Dhabi, Dibai, Sharja, 'Ajman, Umm al-Qaiwain, Ras al-Khaima, and Fujaira, which is on the Gulf of O. The pop. is probably under 100,000 and Dibai is the biggest tn. So far no oil has been found in the dist., and as the pearl fishery has declined there is emigration to the oil-fields and elsewhere. The possibility of finding oil makes the desert valuable and, as there are no landmarks there, the fixing of boundaries is almost certain to lead to strife.

**Omar** (d. 644), Muslim caliph from 634 to 641. He subdued Egypt, Palestine, and Syria and defeated the Persians, and was the first to have the title of Commander of the Faithful. He introduced the new Arabian calendar.

**Omar**, Mosque of, name wrongly given to the Dome of the Rock. This was built by an Umayyad caliph who reigned from 685 to 705, and is not a mosque. It is built over the rock on which the altar of the Jewish temple is believed to have stood, and from it Mohammed ascended to heaven on his Night Journey.

**Omar Khayyam** (c. 1034-c. 1130), Persian poet, mathematician, and astronomer, b. Nishapur, the cap. of Khorasan. O. K. revised the calendar at the invitation of the Seljuq Sultan, Malikshah, and became famous throughout the E. as a mathematician; a work on algebra by him was known in Europe. His name is now inseparably connected with FitzGerald who trans. his *Rubaiyat* (or quatrains) into English in 1859. The authenticity of many of the quatrains has been questioned. See F. Woepke, *L'Algèbre d'Omar Alkayyām*, 1851; Heron-Allen, *Facsimile of the Manuscript in the Bodleian Library*,

1898; eds. of the *Rubdydt* by Whinfield (who pub. a new Eng. version in 1882 and 'the first critical version of the text' in 1883) and John Payne, the poet, who produced another trans. in 1898; Bjerregaard, *Sufi Interpretations of the Quatrains of Omar Khayyām*, 1902; life by J. K. M. Shirazi, 1905; O. Rothheld, *Omar Khayyām and his Age*, 1923; A. G. Potter, *Bibliography of the Rubdydt of Omar Khayyām* (eds. in foreign languages), 1929; essay by L. Housman and biography of FitzGerald by G. F. Maino in Collins's ed. of *The Rubdydt*, 1947; A. J. Arberry, *The Rubdydt of Omar Khayyām*, 1949, and *Omar Khayyām*, 1952.

**Ombre**, or 'The Man,' game of cards invented by the Spaniards. It is played by three persons with a pack of forty cards, the 8, 9, and 10 being dispensed with, and each player is dealt nine cards by threes. Each deal constitutes a game, and one hand plays against the other two, the solo player being called the 'O.' The game is described by Pope in his *Rape of the Lock*.

**Omdurman**, tn in the Sudan, on the l. h. of the Nile, facing Khartoum. It is a trading centre and a pilgrims' resting place, and was the chief tn during the regime of the Mahodi. On 2 Sept. 1898 Brit. forces under Kitchener, advancing up the Nile after the victory at Atbara, encountered the forces of the Khalifa. During the battle the 21st Lancers delivered the last full-scale cavalry charge of modern warfare. Winston Churchill took part in the cavalry charge, and describes the operations in *The River War*, 1899. Pop. 130,400.

**O'Meara, Barry Edward** (1786-1836). Irish surgeon to Napoleon in St Helena. He entered the army in 1804 as assistant-surgeon, served in Sicily and Calabria, and in 1807 went with Gen. Fraser to Egypt, but was dismissed from the army the same year for participating in a duel. After this he served as a naval surgeon, and in 1815 accompanied Napoleon to St Helena. Here he remained for 3 years, but being accused by Lowe of intriguing with Napoleon, was recalled. He pub. *Napoleon in Exile*, 1822, in which he attacked Lowe's treatment of Napoleon.

**Omelet** (the anglicised form of Fr. *omelette*) is a kind of thin pancake. It is made with eggs beaten up lightly, with the addition of milk or water, herbs, cheese, mushrooms, ham, bacon, fish, or game, and salt and pepper for seasoning, according to the requirements, and cooked in a buttered pan. For sweet O.s sugar is used instead of pepper, and fruit added.

**Omen**, name applied by the ancients to signs which were supposed to indicate good or bad fortune, e.g. the appearance of snakes, the flight of birds. See AUGUR; DIVINATION; ORACLE.

**Omer, St** (c. 595-c. 670), Fr. bishop, b. in the ter. of Constance, became a monk at Luxeuil. Later he became Bishop of Thérouanne, his see including the present Pas-de-Calais and Flanders, in Belgic Gaul. To propagate the faith St. O. enlisted many monks, and a great number of abbeys were built. The saint himself was the co-founder of Sithin, and round this

abbey grew up the tn now known as St. O. His feast is on 9 Sept.

**Omer, St** (France), see ST-OMER.

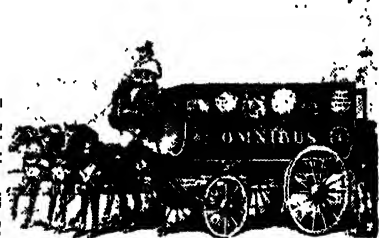
**Omiš**, tn in Croatia, Yugoslavia, on the Adriatic, situated at the mouth of the Cetina, and at the foot of steep mts. From the 10th to the 15th cent. it was the haunt of Dalmatian pirates, who on one occasion captured the daughter of the Doge of Venice. Pop. 12,900.

**Ommanney, Sir Erasmus** (1814-1904), admiral, b. London. He took part in the battle of Navarino (1827), for which he received a medal. He discovered the first traces of the fate of Sir John Franklin (q.v.) in 1850, and for his scientific researches he received the Arctic medal, 1851, was made F.R.S. in 1868, and knighted 1877, being advanced to admiral the same year.

**Ommayyads**, Arabian family of Mecca, the first Arabian caliph dynasty, founded by Muawiyah (c. 610-80) in 661. Under them the Arab realm extended to China and Spain. They were replaced by the Abbasids (q.v.) in 750, but estab. an independent caliphate at Cordova, in Spain, which lasted until 1031.

**Ommiades**, see OMMAYYADS.

**Omnibus** (Lat. 'for all'), name of a public conveyance which has undergone considerable modifications from its early form. The forerunner of the O. by Pascal



SHILLIBEER'S BUS OF 1829

was run unsuccessfully in Paris for a short period in 1662; it was revived in 1819 and introduced to London in 1829 by George Shillibeer. The characteristic that was sanctioned by an Act of 1832 was that it plied for hire throughout its route instead of being available, like the stage-coach, only to those who pre-booked at offices. The characteristic double-decked Brit. vehicle originated with the Great Exhibition of 1851; the 26-seat London garden seat horse-bus in 1881; motor buses were the subject of experiment from 1897 onwards and became estab. (G.W.R. service from Helston to the Lizard) in 1903. The first electric trolley-buses were operated in 1911; they often replaced trams and there is now a tendency for them to give place to the Diesel (or oil-engined) bus. See also BUSES AND COACHES and ELECTRIC TRACTION.

**O'Morgair, Malachy**, see MALACHY, ST. Omphale, the masculine but attractive queen of Lydia, to whom Hercules was slave for 3 years. He doted on her, and led an effeminate life spinning wool, while O. wore his lion's skin and was lady paramount.

**Omphalea**, genus of tropical climbing shrubs, family Euphorbiaceae, 15 species; of which *O. megacarpa*, Hunter's Nut, yields large nutritious nuts and is cultivated in the W. Indies, and *O. triandra*, the Pop-nut or Cob-nut, yields a juice that is used in ink-making and a nut that is edible after removal of the poisonous embryo.

**Omphalodes**, genus of annuals and perennials (family Boraginaceae), bearing racemes of white or blue flowers. *O. linifolia* (Venus's navelwort) is a white-flowered annual, often grown in garden borders. *O. luceline* (Rock navelwort) is a blue-flowered perennial of considerable value in the rock garden. The plants prefer a partly shaded position. *O. verna*, Blue-eyed Mary, is a creeping perennial, naturalised in Britain.

**Omphalopsychol**, 'those with their souls in their navels,' navel-contemplators, a term of abuse for the followers of St Gregory Palamas of Mt Athos (d. 1359) used by Barlaam, an It. Gk and eccles. adventurer who later became Bishop of Gerace in Calabria (1348) and taught Petrarch Greek. See HESYCHASTS.

**Omsk**: 1. Oblast in W. Siberia, lowland traversed by the R. Irtysh, with mixed forests in the N. and steppe in the S. It has dairy farming, sheep breeding, wheat growing, lumbering, engineering, woodworking, and food and light industries. The area was gradually annexed by Russia in the 16th-early 18th cents.; in the late 19th cent. it developed extensive dairy farming and butter production. Area 53,800 sq. m.; pop. (without O. city) 1,100,000, mostly Russians, also Ukrainians and some Tatars.

2. Cap., economic and cultural centre of the above, on the Irtysh and the Trans-Siberian Railway, directly subordinated to the Gov. of the Russian Federal Rep. It has engineering (agric. machinery), oil refining (pipeline from Tuymazy fields in Bashkiria), wood-processing, and varied light and food industries. O. was founded in 1716 as a Russian fortress in the S. defence line of W. Siberia; it became a tn in 1804, prov. cap. in 1822, and administrative centre of the Steppe ter. (now central and E. Kazakhstan) in 1882. After the Trans-Siberian Railway reached O. it became the commercial centre of W. Siberia and the biggest Siberian tn. The Bolsheviks were overthrown in O. in 1918, and for over a year it was the centre of anti-Bolshevik struggles in Siberia and the seat of Kolchak's gov. (see KOLCHAK). In 1919-22 O. was the seat of the Bolshevik Siberian Revolutionary Committee. There has been rapid industrial development since the Second World War. Pop. (1956) 505,000 (second in Siberia; c. 1914, 128,000; 1926, 162,000; 1939, 281,000).

**On**, see HELIOPOLIS.

**Onager**, or *Equus onager*, species of

mammal in the family Equidae, is the best-known wild ass of Asia (it is now included in the subgenus *Asinus*). It occurs in the steppes of W. and central Asia, and so closely resembles *E. hemippus* of Syria (which was considered specifically distinct by Geoffrey St Hilaire) that it is thought probable they belong to the same species. The O. is a swift-footed animal, sandy in colour, but with a dark stripe running down its back.

**Onagraceae**, dicotyledonous family of herbs and shrubs bearing red, white, yellow, blue, or purple axillary or terminal flowers, and opposite or alternate simple leaves. Genera include *Clarkia*, *Epilobium*, *Fuchsia*, *Godetia*, *Oenothera*, *Trapa*, *Zauschneria*.

**Onamuchi**, see OHONAMUCHI.

**Onas**, see FUEGIANS.

**Onatas**, of Aegina, Gk sculptor who fl. in the middle of the 5th cent. BC.

**Oncidium**, very large genus of epiphytic orchids, chiefly found in Peru, Ecuador, Mexico, and W. Indies, family Orchidaceae, over 500 species, varying considerably in form, colour, and size.

**Ondarrabia**, see FUENTERRABIA.

**Ondes Musicales**, or **Ondes Martenot**, electrophonic instrument invented by Maurice Martenot of Paris in 1929. It produces notes from the air graded according to the chromatic scale by a special device. It has a warbling note, which keeps in tune with the other orchestral instruments. Honegger used the O. M. in his *Jeanne d'Arc*.

**Onega**, lake in NW. Russia, second largest in Europe. Area 3800 sq. m. It is connected by the R. Svir' with Lake Ladoga and the Baltic, and by artificial waterways (see WHITE SEA-BALTIC CANAL; MARINSKIY WATERWAY) with the White Sea and the Volga.

**Oneglia**, see IMPERIA.

**Onehunga**, maritime bor. of N. Is., New Zealand, 6 m. from Auckland, of which it is a suburb. O. is of historic interest in that it was originally settled by military pensioners from England, and had the first lady mayor in the Brit. Empire (1894). Pop. 16,674.

**Oneida**: 1. City of Madison co., New York, U.S.A., situated at a height of 440 ft. above the sea, on the O. Creek, 26 m. W. of Utica. The prin. manufs. are silverware, caskets, fertilisers, electrical supplies, plaster and paper products. The vil. of O. Castle, to the SE., forms the gathering-place of the O. Indians, whilst the H.Q. of the co-operative O. community (see NOYES, JOHN HUMPHREY) are also to the SE. Pop. 11,325.

2. Lake in New York, 6 m. to the NW. of O. city, between the cos. of Oswego, O., Onondaga, and Madison. It is 20 m. long by 5 m. wide, and is drained by the O. R. into Lake Ontario.

**Onida**, N. Amer. Indian tribe, one of the Iroquois Confederacy (q.v.). To-day there are about 2500.

**O'Neil, Bryan Hugh St John** (1905-54), distinguished archaeologist who was a leading authority on prehistoric and Roman periods in England and Wales and on late medieval fortifications. He was



chief inspector of ancient monuments from 1945 until his death; he himself undertook much excavation work in the Brit. Isles and gave great encouragement to the field-work of others. He wrote and ed. many of the guide-books pub. by the Ministry of Works, was Rhind lecturer in archaeology in 1946, a member of the Royal Commission on Historical Monuments, and a vice-president of the Society of Antiquaries, 1946-50.

O'Neill, Eugene Gladstone (1888-1953), Amer. dramatist, b. New York City. His father was James O'N., a well-known actor, who was celebrated in America for his star part in the old melodrama of *Monte Cristo*. O'N. studied at Princeton and Harvard, and then for a number of years led a most adventurous and varied existence. He went on a gold-hunting expedition to Honduras, spent sev. years in central and S. America, and worked as a sailor for 2 years. Returning to the U.S.A. he worked for a short time as a reporter, played a minor role in his father's company, and then spent months roaming the dock region of New York City. Stricken with tuberculosis, while in a sanatorium he wrote some one-act plays which were pub. at his father's expense. Upon restoration to health he went to Harvard Univ., and took a course in dramatic writing. *The Moon of the Caribbees* and *Six other Plays* was pub. in 1919. In the same year appeared *Beyond the Horizon*, his first full-length play. This won the Pulitzer prize in 1920, an honour later gained by 3 more of his plays. His early one-act dramas had been filled with realism, but *Emperor Jones*, 1921, was a clear break with this, being rather an experiment in expressionism. The central figure, after whom the play is named, is a Negro who has made himself by sheer brute strength monarch of the ex-slaves in a W. Indian Is. There is a revolution against him. In 8 short episodes the audience is shown the change from the proud emperor to the timorous, superstitious black, lost in the jungle whither he has fled from those who seek his life. Out of O'N.'s knowledge of the docks and the sea grew *Anna Christie* 1922, another study in realism, which achieved great success both in New York and in London. *The Hairy Ape*, which appeared in the same year, is a second drama of expressionism. *Desire under the Elms*, 1924, reverts to realism, being a tragedy of passion played out on a New England farm.

*The Great God Brown*, 1925, has been acclaimed as one of the finest imaginative productions in Amer. literature. Here O'N. showed his growing distaste for mere naturalism and his increasing employment of symbolism. The same is true of his *Lazarus Laughed*, 1927; *Lazarus* d. and returned to life with the knowledge of what death is and its place in the larger purpose. *Strange Interlude*, 1928, is one of the strangest of all his dramas. Edouard Dujardin, the Frenchman, discovered the interior monologue for literature, and was followed by James Joyce in his *Ulysses*; O'N. adapts the interior mono-

logue to the stage. Running to 9 acts, and taking 5 hrs to play, it is a test of the patience and attention of the audience. Though its construction may appear fantastic and unreal, in actual presentation it is highly effective. O'N.'s concern is with human beings caught up in the currents of life, and struggling against the forces of evil. He deals largely with the depressed classes, and especially with the colour problem, though his *Mourning Becomes Electra*, produced in London in 1938, was a powerful and sombre modern psychological study of the Electra complex. His *Days without End*, 1934, is a modern miracle drama. In 1936 he was awarded the Nobel prize. Later works include *The Iceman Cometh*, 1946, and *A Moon for the Misbegotten*, 1947. He left an autobiographical drama, *Long Day's Journey into Night*, which was produced after his death and won the Pulitzer prize, making his fourth award, a record for a playwright, and the only time that a Pulitzer prize had been given posthumously. O'N. was married 3 times, and his daughter Oona married Charles Chaplin, the film comedian. See studies by S. K. Winther, 1934; R. D. Skinner, 1935; B. H. Clark, 1947; also J. W. Krutch, *The American Drama since 1918*, 1939.

O'Neill, Hugh, see TYRONE, EARL OF and IRELAND.

O'Neill, Owen Roe (c. 1590-1649), Irish soldier, nephew to Hugh O'N. (see TYRONE, EARL OF). He fought in the Sp. Army, and came to Ireland after the outbreak of the great rebellion of 1641. He was given command of the Ulster forces on the side of the Confederates, and fought with great success until his death in 1649.

O'Neill, Peggy, see EATON, MARGARET O'NEILL.

O'Neill, Shane, 2nd Earl of Tyrone (c. 1530-67), Irish chief and rebel, oldest legitimate son of Con O'N. (1484-1559) (who was made Earl of Tyrone by Henry VIII in 1542). After much civil strife he was recognised as chief by Elizabeth on her accession, but the recognition was revoked. During his life Ulster was the scene of constant war. He was again acknowledged chieftain of Tyrone in 1563, but with a reservation as to the rights of Hugh (who succeeded to the title in 1587); made a treaty with the English at Drumcece (1563); captured the chief of the MacDonnells (1565); invaded the Pale (1566); burned Armagh (1566); was defeated by the O'Donnells at Letterkenny in 1567, and murdered by the MacDonnells at Cushendun. See ISLAND SCOTS.

Oneonta, city of New York state, U.S.A., in Otsego co., on the l. b. of the Susquehanna, 73 m. SW. of Albany. It has railroad shops and flour-mills, and manufs. clothing, gloves, machinery, and wood products. It is the seat of Hartwick College and a state teachers' college, and there is a tuberculosis hospital. Pop. 13,560.

Onesimus, St. disciple of St Paul, under whose influence he came after robbing and running away from his master Philemon, a citizen of Colossae. See Paul's Epistle to Philemon.

**Ongtong**, see under LORD HOWE ISLAND.

**Onion** (*Allium cepa*), bulbous-rooted plant (family Liliaceae), probably a native of central or W. Asia, and cultivated from a remote period. By successive sowings and by careful storage, O.s may be had all the year round. Usually 2 main sowings are made: the chief, early in spring, to produce O.s for autumn and winter use, or for storing. The other sowings are made towards the end of the summer, for transplanting in the spring, a system by which larger and earlier bulbs are obtained which are seldom, if ever, attacked by the O. fly. In ordinary gardens the thinnings from the autumn sowings usually provide a sufficient supply of the green or spring O.s used in salads. Any except stagnant soils will grow O.s if well manured and if rotations of crops are followed, but only a deep, rich loam produces the heaviest crops. The growth of large O.s for competition at shows is very popular. Unlike much exhibition produce, their mild flavour makes them generally preferable in the kitchen to those less carefully grown. The best O.s for use in pickling are small, hard bulbs produced from April sowings on rather poor, dry, sunny land.

**Onions, Charles Talbot** (1873- ), philologist, educ. at King Edward VI School and Mason College, Birmingham. He entered the teaching profession, and then in 1895 joined the staff of the *Oxford English Dictionary*, of which he became joint editor in 1914. He continued his association with the dictionary until 1933, and was also editor of 3 eds. of the *Shorter Oxford English Dictionary* in 1933, 1936, and 1944. He was lecturer in Eng. literature at Oxford Univ., becoming fellow of Magdalen College in 1923, and in 1927 was appointed reader in Eng. philology. He was awarded the C.B.E., 1934. His valuable *Shakespeare Glossary* was first pub. in 1911; a second edition appeared in 1919.

**Onions, George Oliver** (1873- ), novelist, b. Bradford. He changed his name in later life to George Oliver, but wrote as Oliver O. He studied art in London and Paris, and worked for a time as illustrator and designer. His first book was *The Compleat Bachelor*, 1901, but his first real success was with the trilogy of novels *In Accordance with the Evidence*, 1912, *The Debit Account*, 1913, and *The Story of Louie*, 1913. Others are *Good Boy Seldom*, 1911, *Mushroom Town*, 1914, *The New Moon*, 1918, *A Case in Camera*, 1920, *The Open Secret*, 1930, *Cockcrow*, 1940, *Poor Man's Tapestry*, 1946, which was awarded the Tait Black Memorial Prize, *Arras of Youth*, 1949, and *Bells Rang Backwards*, 1953. He has written highly effective ghost stories, collected in *Widdershins*, 1911, *Ghosts in Daylight*, 1924, and *The Painted Face*, 1929. He married Berta Ruck (q.v.), the novelist.

**Onitsha**, tn. of S. Nigeria, on the E. bank of the Niger, at the beginning of the delta region. Its position renders it an entrepôt for the trade of the dist. Pop. 77,000.

**Onnes, Heike Kamerlingh** (1853-1926), Dutch physicist; b. Groningen, where he studied and gained his Ph.D. He was for some time director of the physical laboratory at Leyden, where he was the first to liquefy helium, at -269° C., in 1908. He discovered superconductivity—the complete loss of electrical resistance at a very low temp. in certain metals. He received the Nobel prize for physics in 1913, and was elected foreign member of the Royal Society in 1916.

**Onobrychis**, genus of leguminous herbs or shrubs with pinnate leaves and axillary spikes of racemes of purple, red, or white flowers. *O. radicata* is grown on the rockery; *O. viciifolia* is the fodder plant, Sainfoin (q.v.); its vars. *arenaria* and *montana* are sometimes grown in gardens.

**Onomatopoeia** (Gk *onoma*, word; *poiein*, to make) is a figure of speech in which the sound of words corresponds with the sense they convey. Many single words are onomatopoeic, such as 'bang,' 'clink,' 'splash.' So also are Tennyson's lines:

'The moan of doves in immemorial elms,  
And murmuring of innumerable bees.'

See also FIGURE OF SPEECH.

**Onomichi**, city and port of Hiroshima-ken, Honshu, Japan, on Inland Sea. It manufs. fancy mats, and saké (q.v.) is produced. There are 48 Buddhist temples. Pop. 85,000.

**Ononis**, genus of ann., biennial, and perennial herbs, family Leguminosae, about 70 species; *O. repens*, *O. spinosa*, and *O. reclinata*, the Restharrowes, are found in Britain; *O. natrix* is the Goat-root of S. Europe, and *O. spectiosa* of Spain is probably the most beautiful of the genus.

**Onopordon** (-um), genus of 12 ann., biennial, or perennial herbs, family Compositae, of which *O. acanthium*, the Common Cotton or Scotch Thistle, is found in Britain as a biennial.

**Onslow Bay**, on the SE. coast of N. Carolina, U.S.A., between Cape Lookout and Cape Fear, about 100 m. long and 25 m. wide. It receives the Newport, New, White Oak, and other rvs.

**Ontake**, sacred Jap. mt in the Jap. Alps, with a 14th-cent. Shinto shrine at the summit. Altitude 11,000 ft.

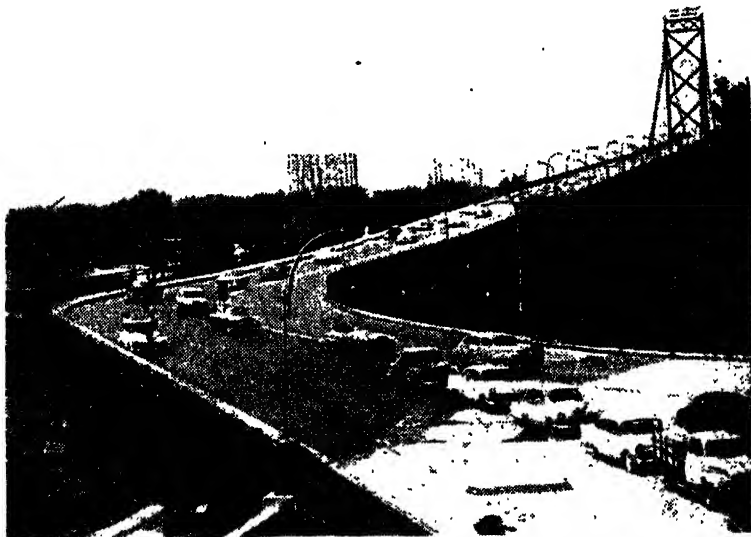
**Ontario**, SE. prov. of the dominion of Canada, separated from the U.S.A. by the St Lawrence R. and the Great Lakes of Superior, Erie, Huron, and O.

O. is that section of the dominion which is contained between the great international lakes and Hudson Bay, and between the W. boundary of Quebec and the E. limits of Manitoba. Its most S. point is lat. N. 41° 41' and its most N. lat. N. 56° 48'. Until 1912 its total area was 260,862 sq. m. In that year the prov. was extended by Act of Parliament to include the E. portion of Keewatin as far N. as Hudson Bay, and its area now amounts to 412,582 sq. m., of which its water area of 49,300 sq. m. forms the unusually large percentage of 11.9. The area is thus about equal in extent to the combined areas of the 6 New England states of the U.S.A. The pop. is upwards of 5,350,000, making it the most populous of the

Canadian provs. The pop. increased by 2,110,000 between 1871 and 1938. The W. portion of Keewatin is now included in the prov. of Manitoba. The Canadian portions of the Great Lakes cover an area of 40,354 sq. m. The NW. point of the prov. is close to Port Nelson on Hudson Bay, and its NE. boundary is formed by James Bay, an extension of Hudson Bay. The surface is of an undulatory character, in parts well suited to agriculture, with low ranges of hills extending westwards towards Lake Huron. The prov. is watered principally by the St Lawrence

carried on under unusually favourable conditions. The tobacco plant is extensively cultivated in the SW. area (the only tobacco grown in Canada), producing an ann. crop worth \$75,000,000.

O. is rich in minerals, the prin. being gold, nickel, silver, cobalt, blamuth, arsenical ore, zinc, and lead. Huge deposits of low-grade iron ore exist. The value of mineral production in O. in 1955 was \$578,000,000. Gold represented \$86,024,345 of the prov.'s production in 1955, and with other metals, of which nickel (\$176,000,000 in 1954), copper



*Ontario Dept Travel and Publicity*

AMBASSADOR BRIDGE, WINDSOR, ONTARIO

and Ottawa R.s, and their numerous tribes. The largest lakes exclusively in O. are Nipissing, Simcoe, and Nipigon. The climate of O. is healthy and bracing, but in most parts colder in winter and warmer in summer than that of Great Britain. At Toronto the temp. ranges from 89° to 13° 3', giving a mean temp. for the year of 44° 8'. The rainfall averages 35 in. annually. The soil of the arable areas is exceedingly fertile, and over 9,000,000 ac. are under crops, the chief being oats, wheat, barley, and maize; the minor crops include rye, peas, mixed grain, sugar beets, potatoes, and turnips. Agric. production in 1955 was valued at over \$1 billion. Dairy farming and cattle raising are engaged in. Fruit farming, especially in the Niagara dist., is carried on extensively, and splendid apples and peaches are grown. General farming, also a most important primary industry, is

(\$81,300,000 in 1954), silver, iron ore, and cobalt were the chief, made up over 70 per cent of the total for the prov. The nickel for the Sudbury dist. amounts to 90 per cent of the world's production. Mining is a thriving industry in the Sudbury, Cobalt, Kirkland Lake, and Porcupine dists. Coal has not yet been discovered in any appreciable quantity, though lignite is being raised in the James Bay region, and the means of obtaining it are rendered comparatively simple by the excellent system of canalisation and lake communication with the coal-bearing dists. outside the prov. Iron ore deposits are being tapped; 1954 production was \$20,341,203, of which half came from Steep Rock. Uranium mining has started with Blind R. field looming as the largest producer in N. America. The deposits of high-grade mica and other essential war minerals proved valuable for the Brit.

market when its feldspar supply from Scandinavia was cut off (1940). Development work for the production of asbestos was begun in 1941. The greater part of the Canadian production of common salt comes from wells in SW. O. Gypsum is mined in Paris, O. Lumbering is an important industry, and the productive forests, which cover 174,000 sq. m., yield spruce, pine, birch, poplar, and other valuable timber. Fur production is valued at over \$3,000,000 annually. The petroleum wells in the SW. of the prov. produce a steady supply of oil. The

young country like Canada, in parts of its wealthiest prov., O., soil erosion, deforestation, and loss of water resources should have become extensive. The Ganaraska R., selected as a considerable area for post-war development, drains about 75,000 ac., and the water reaches have been seriously deforested, with wind and water erosion continuing after the destruction, so that a considerable portion of the upper part of the Ganaraska watershed is now unfit for successful agriculture. Its reforestation and other conservation methods will, however, be supplemented



*National Film Board, Canada*  
QUEENSTON POWER PLANT, NIAGARA FALLS, ONTARIO

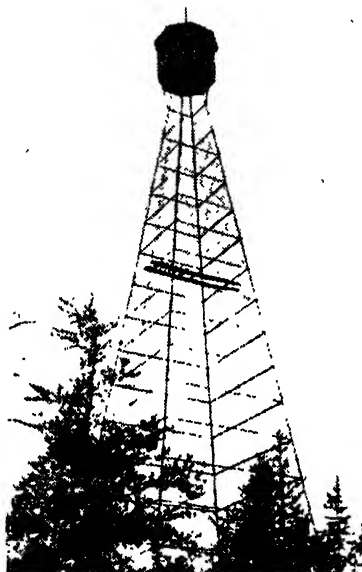
fisheries yield cod, salmon, bass, herring, lobsters, and mackerel. O., of all the Canadian provs., is the centre of the country's manufacturing life, owing to its abundant water-power resources and its proximity to the coal-fields of Pennsylvania. Hydro-electric power systems, using Niagara and other falls, were producing upwards of 5,000,000 h.p. at the end of 1955. The manufs. are numerous and varied, agric. implements, railway rolling stock, and textiles being the most important; but during the Second World War there was a rapid increase in the output of many kinds of munitions and other special manufs. essential to the Allies' war effort, such as aero engines and aeroplane construction generally. The output equals that of the rest of Canada. There is great activity in the canning and pork-packing industries.

In respect to post-war planning schemes it is an important commentary that in a

by dams for flood control. Spring flooding on the W. of S. O. is a very serious ann. danger, causing substantial loss to municipalities along their shores.

O. is well equipped with a variety of educational institutions, and has univ. and colleges of importance. In recent years there has been in Canada a tendency to lengthen the period of compulsory attendance, and this tendency has been most marked in O., where in 1919 an Act was passed providing that children from 8 to 14 years of age must attend full time, and that young persons from 14 to 16 who were below univ. matriculation standard must also attend full time; those exempted owing to their occupations must attend part-time classes. The operation of this Act has greatly increased the attendance in O. secondary schools. The average number of pupils attending educational institutions is over 1,000,000. The O. agric. college and experimental

farm at Guelph were estab. in 1874 to train young farmers in the science and practice of agriculture and to conduct experiments for the benefit of the prov. The Kemptville agric. school and farm had grown rapidly in importance before the Second World War. The horticultural experiment station at Vineland in the centre of the Niagara fruit belt is the most important station in Canada for work on the special problems of the fruit and vegetable grower. Other similar institutions are the Ridgeway experimental



(Ontario Dept of Lands and Forests)

#### A FIRE-DETECTION TOWER IN ONTARIO

farm in the SW. peninsula and the New Liskard demonstration farm in N. O. The leading denominations in O. are United Church of Canada, Rom. Catholics, Church of England, and Baptists, in the order named.

The ordinary revenue and expenditure in the years immediately preceding the Second World War balanced at about \$90,000,000. In 1955-6 the gross interim figures were revenue, \$411.3 million; expenditure, \$410.6 million. The estimated wealth of O. represents about one-third of that of the whole dominion.

The prov. has a separate Parliament and administration, with a lieutenant-governor at its head, assisted by 90 members (elected for 5 years), forming a Legislative Assembly which has power to control its own affairs, but must not

conflict with the policy of the central administration of the dominion, to which are sent 82 members and 24 senators. The Executive Council consists of 13 members, 9 holding portfolios. Besides the regular depts, certain commissions have been created for specific purposes; these include the Niagara Falls Park Commission, Railway and Municipal Board, Hydro-Electric Power Commission, and Timiskaming and N. O. Railway Commission. The cap. is Toronto. Other important cities are Ottawa (seat of national gov.), Hamilton, Windsor, London, Brantford, and Kingston (qq.v.). There is railway communication to all parts of the prov. Before the War of Independence the country was sparsely inhabited by roving tribes of Indians; but on the close of the war of 1783 thousands of Brit. loyalists crossed over into Canada, and this portion was called Upper Canada, a name it continued to bear until 1867, when it was renamed O. It is the premier prov., and is considered the most flourishing in the dominion. See also CANADA. See A. H. D. Ross, *Ottawa, Past and Present*, 1927; E. C. Guillet, *Early Life in Upper Canada*, 1933; F. Landon, *Western Ontario and the American Frontier*, 1941, and *Western Ontario*, 1943; R. L. Jones, *History of Agriculture in Ontario, 1613-1880*, 1946; and O. Bureau of Statistics and Research, *A Conspectus of the Province of Ontario*, 1947.

**Ontario, Lake,** lake of N. America, forming part of the S. boundary of the above prov., situated between lat. 43° and 44° N. and long. 76° and 80° W. Its length is 185 m., and its mean breadth is about 50 m.; its depth ranges from 15 to 120 fathoms. The St Lawrence R. forms its outlet on the NE., while in the SE. it receives the waters of Lake Erie, by means of the Niagara R. and the Welland Canal. Its area is over 7000 sq. m., and it contains sev. ls. at its E. end. The lake abounds in fish, and it is noted for its Oswego bass. The chief Canadian ports on its shores are Toronto, Hamilton, Kingston, Port Hope, and Coburg, while Oswego, Sackett's Harbor, and Charlotte are the chief Amer. Storms are prevalent on the lake, whose coasts are studded with lighthouses.

**Onteniente,** Sp. tn in the prov. of Valencia, on the Clariano. Pop. 14,000.

**Ontology** (adapted from a Late Lat. word, *ontologia*, from the Gk *ôn*, *ontos* the present participle of the verb *einai*, to be, and *logos*, word or science), the name given to that branch of philosophy (see METAPHYSICS) which deals with the immaterial concepts of essence, existence, etc., as distinct from psychology and natural theology. The name given to the science by Plato was 'dialectic,' whilst Aristotle's 'first philosophy' was akin to it. A great part of metaphysics has been bound up with these matters, although, of course, in the dawn of philosophy the possibility of objective reality was not questioned. Wolff was the first philosopher to use O. as a technical term. He divided theoretical philosophy into that which deals with being in general (subjective or objective)

and that which deals with particular entities. The former he called O., whilst the latter was divided into psychology, cosmology, and natural theology, according as the entities were the soul, the world, or God. The theory that the nature of knowledge itself is the first study of philosophy, and that not until a conclusion has been come to on this does the nature of being admit of study, has of late years superseded Wolff's theory. Thus with the evolution of metaphysics O. has been relegated to a secondary place. See articles on METAPHYSICS; PHILOSOPHY; PSYCHOLOGY; etc., and on the various religious systems, all of which have some ontological basis. See J. MacTaggart, *Nature of Existence*, 1927; G. Santayana, *Realm of Essence*, 1928; C. G. Stone, *The Social Contract of the Universe*, 1930; E. Meyerson, *Identity and Reality*, 1930; F. Coffey, *Ontology*, 1938; W. Ehrlich, *Ontologie des Bewusstseins*, 1940; L. De Raeynacker, *Philosophie de l'être*, 1946; P. J. Glenn, *Ontology*, 1955.

**Onus Probandi**, see PROOF, BURDEN OF. **Onyhiolum**, family Polypodiaceae, genus of evergreen ferns with finely divided, graceful fronds. *O. siliculosum* needs stovehouse culture; *O. japonicum* is more hardy, but must be kept somewhat dry in winter. It is easily increased by div. of its numerous crowns.

**Onychophora** (Gk *onus*, claw; *pherein*, to bear), class of the phylum Arthropoda (i.e. insects, crustaceans, and other invertebrates with jointed legs), includes sev. genera, but the term *Peripatus*, estab. by Gudding (1826), is still commonly used as the generic name for all. He included it in the Mollusca, but Moseley (1874) proved conclusively its arthropod structure. The characteristics of the class are the presence of air tubes, tracheae; a dermocomuscular body wall; paired excretory ducts, the nephridia; and a body composed of many similar segments bearing 'feet.' The head bears single pairs of antennae, jaws, and

has been regarded as providing the 'missing link' between the 2 groups.

**Onyx**, chalcedony composed of alternating white and black or dark brown layers. These colours are often modified by artificial staining in order to enhance the value of the stone for ornamental purposes. It was highly valued by the ancients and used for cameos. The term 'O. marble' was at one time applied to alabaster. A variety of O. is sardonix, which contains alternating bands of dark red carnelian (sard, q.v.). The best varieties of O. are obtained in India.

**Oodnadatta**, tn of S. Australia, NW. of Lake Eyre, on the railway from Port Augusta to Alice Springs. Pop. 100.

**O'okiep**, mining tn of Namaqualand (q.v.), Cape Prov., S. Africa, 92 m. ESE. of Port Nolloth. Its fortunes fluctuated with the world price of copper, which is mined in the dist. Sparsely populated and very dry. Pop.: Whites, 654; Coloureds, 644; Bantu, 565.

**Oolite**, or **Roestone**, limestone which is composed of small rounded grains, which show in thin section under the microscope a concentric shell arrangement. Each grain shows also a radial structure, and under polarised light should give a black cross if a true sphere. The concentric layers of the grain are gathered round a nucleus, which may be a quartz granule, a piece of shell, or other organic body. Some modern O.s (as at Karlovy Vary) may be due to algae (*Hirvanella*) which secrete lime from the surrounding waters and build up these radiate and fibrous grains. The O.s are well developed in the Jurassic system, the coarser varieties being called peastone or pisolite.

**Oology**, science relating to birds' eggs, their identification, classification, etc. The general characteristics of birds' eggs are a shell composed chiefly of carbonate of lime with smaller quantities of phosphate of lime and magnesia, a membrane enclosing the food material, the white or albuminous food material, the yolk or yellow portion, and the minute germ from which the living organism develops. Some shells have an outer glazed layer like porcelain glaze, as in the ostrich egg; others have a chalky outer layer, as in the eggs of cuckoos, cormorants, and grebes; yet others have a translucent outer layer as in the kingfisher's egg. Eggs are also identified by their shape; those of the plover are pear-shaped, those of the sandgrouse cylindrical, those of owls are spherical, while the majority have the familiar shape of the hen's egg. Colour, or pigmentation, occurs in wide variety, both in individuals and in different species. The uniform tints or ground colouring may be brownish, blue, yellow, brick-red, or green; superposed on this may be lines or spots or both of different colour or different intensity, while the eggs of rails and plovers often exhibit double spots; that is, strongly marked spots superposed on a wider area of fainter hue. It may be mentioned that a special licence is necessary for the collection of wild birds' eggs, as they are now almost everywhere protected by law.

#### PERIPATUS

oral papillae; the openings of the tracheae are scattered over the body. The jaw muscles are striated. Malpighian tubules are absent. *Peripatus*, of which there are many species, is found in the S. continents, Malay, New Zealand, and E. and W. Indies. It looks somewhat like a caterpillar of medium size, and lives in damp places under the bark of trees. In its heart and lacunar circulation, small coelom and haemocoel, salivary glands, the presence of tracheae, the modification of its anterior appendages as mouth parts, and its regular ecdysis, *Peripatus* resembles the Arthropoda. It differs from them in the absence of exo-skeleton and external segmentation; the soft cuticle and muscular body wall; the segmentally arranged nephridia with ciliated tracts. In these and other characters it resembles the Annelida (segmented worms), and

**Oorial**, *see* URIAL.

**Oort, Adam van**, *see* NOORT.

**Oosterbeek**, vil. in the Netherlands (prov. of Gelderland), 3 m. W. of Arnhem, was the 1st Airborne Div. H.Q. in the Arnhem battle. A memorial was unveiled in 1946 to the Brit. troops, most of the dead being buried in a nearby cemetery.

**Oosterhout**, tn in the prov. of N. Brabant, Netherlands, 5 m. N.E. of Breda. There is trade in agric. produce, manufs. of pottery and tiles, tanning, leather, and sugar-refining. Pop. 22,100.

**Oostkamp**, tn in the prov. of W. Flanders, Belgium, 4 m. S. of Bruges; mainly engaged in agriculture, cattle breeding, and manufs. of linen. Pop. 8000.

**Ootacamund**, tn of Madras state, India, situated in the Nilgiri Hills at a height of 7500 ft. O. was formerly the hot weather H.Q. of the Madras Gov., and is a favourite summer resort.

**Ooze**, *see* OCEAN AND OCEANOGRAPHY.

**Opacity**, that property of a body which prevents light passing through it. Newton explained this property by the unequal densities of the particles of the body, the light being so irregularly reflected and refracted that ultimately it becomes absorbed. On the wave theory of light it is explained as being due to the fact that the particles of the body absorb the light, converting the energy into heat.

**Opah**, *see* CENTRARCHIDAE.

**Opal**, hardened colloidal condition of silica, usually containing a small percentage of water. Water content varies from 1 to 21 per cent; in precious O. it is generally 6-10 per cent. It is found disseminated in veins and nests through rocks, and is also formed from the siliceous waters of some hot springs (geyserite). In colour O. is white, grey, yellow, red, etc., the colours varying according to the position in which the stone is held. Precious O., which exhibits a delicate play of colours (opalescence), is found in Hungary, Mexico, Queensland, New S. Wales, and S. Australia, and for jewellery is cut with a convex surface. Large stones are difficult to procure for jewellery, owing to the multiplicity of flaws with which they are intersected. Fine O. found in Mexico gives fire-like reflections. Hydrophane is an opaque white or yellow variety, which becomes translucent and opalescent on immersion in water. Wood O. is wood replaced by silica, the grain of the wood being preserved. It has a variety of colours, and is used for ornamental purposes. Hyalite, a transparent glossy variety of O., occurs in stalactitic forms. Menilite or Liver O. occurs in concretionary forms in shaly deposits. Float-stone is a tuberculous or porous siliceous mass which floats on water. Tripoli infusorial earth is related to O. The O. was once thought to bring misfortune to its owner, but the superstition has lost ground in recent years.

**Opava** (Ger. *Troppau*), Czechoslovak tn in the region of Ostrava (q.v.), on the Oppa. It was once cap. of Austrian Silesia (*see* SILESIA). Textiles and paper are manuf. Pop. 30,200

**Open Field System.** O. F. S. of farming was in vogue during the time of William I. The arable land of the manor farms consisted of 3 large open fields: one for wheat or rye (the bread crop); another for barley, for barley cakes and beer (the drink crop); and the third ploughed to rest the soil (fallow). The fallow field in the next year would be sown for wheat, while the barley field would become fallow, so that every 3 years each field would in turn be rested. The fields were divided into strips of 1 ac. or  $\frac{1}{2}$  ac., and were separated by low ridges of unploughed turf, instead of by hedges, thus being open, as opposed to the enclosed field of to-day. Laxton in Notts is farmed in some degree on similar lines to-day, and at Eton certain meadows are thrown open during Aug., Sept., and Oct. to the cattle of the villagers, under the care of a 'hayward.' *See also* map on p. 424. *See* OPEN SPACES AND COMMONS.

**Open Hearth (Siemens) Steel Process**, *see* IRON AND STEEL.

**Open Spaces and Commons.** Parks and recreation grounds in tns are very erratically distributed and often quite inadequate. Some cities and bors. in Great Britain (notably spa tns and holiday resorts) have well over 10 ac. or more per 1000 inhab., others hardly any. The National Playing Fields Association recommends that at least 6 ac. of playing-field space a 1000 pop. are required, all permanently reserved for the purpose, and preferably in public ownership. For parks and public gardens the association considers that at least a further 1 ac. a 1000 pop. should be provided. These standards were endorsed in 1956 by the Ministry of Housing and Local Gov. as a guide for the reservation of O. S. in development plans; in those for tns it considered the provision made had frequently been too low; the trend of demand was likely to rise with the growing interest in athletics and an increase in leisure time. The Ministry of Housing and Local Gov. mentioned also that a target of 4 ac. of allotments a 1000 pop. was recommended by the Allotments Advisory Committee of the Ministry of Agriculture (1950); many tns are far short of this quota.

London Co. had in 1951 only 2.47 ac. a 1000 of all kinds of O. S. with public access; while the bors. of Woolwich and Westminster had 7 ac. a 1000, Islington and Shoreditch had only a quarter-ac. a 1000. The Co. of London Development Plan, 1951, aims at an ultimate 2½ ac. a 1000 in 20 years, and this is regarded as very difficult to attain. In other countries similar shortages exist: thus New York City in 1938 had 1 ac. of O. S. a 1000 inhab.; its planners considered 3.33 ac. a desirable minimum, perhaps unattainable.

All co councils and local authorities in Great Britain have powers under the Open Spaces Act, 1906, to acquire land for O. S. and to maintain and regulate it. Many recreation grounds and parks have been provided under this and earlier Acts. Grants may be made by co. councils and the Exchequer under the Physical Recreation Act, 1937. The National Playing

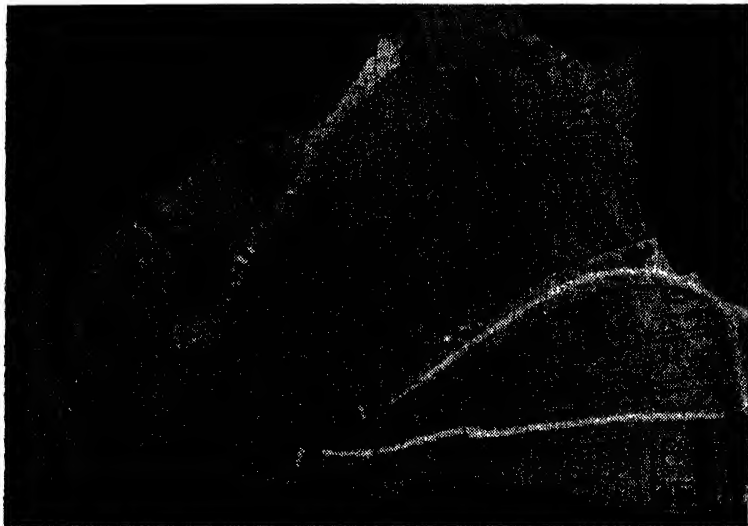
Fields Association also makes grants for playing fields from the King George VI Memorial Fund. Under the Town and Country Planning (q.v.) Acts land in development plans may be zoned as O. S., and such land may be acquired by agreement or compulsorily by a local authority for playing fields, parks, or allotments (see also GREEN BELTS). The London Co. Council and some other local authorities also have powers under local Acts to provide or contribute to the provision of sports and pleasure grounds, public walks, etc.

Open Spaces, and Footpaths Preservation Society.

Opencast Mining, see MINING.

Openshaw, see MANCHESTER.

Opera, drama of any description in which the text is wholly or partly sung and accompanied by an orchestra. The modern art-form arose in Italy about 1600, but its origins go back much farther, through the medieval mystery plays to the Attic drama, in which music played an important part. Perhaps the first essay in the direction of O. was the song-play of the 13th cent., *Robin et Marion*



OPEN FIELD SYSTEM

From an old map of Laxton in Nottinghamshire.

Commons and common fields are in a somewhat different category. Usually they are wastes and pastures which have never been individually appropriated, but are used in common for grazing or other purposes by the inhab. of a par. or dist. Many ant. commons and common fields passed into private ownership by the Enclosure Acts in the 18th and early 19th cents.; those that remain, which cover extensive areas, are protected from enclosure by the Commons Preservation Act, 1876, and defended by the watchfulness of the Commons, Open Spaces, and Footpaths Preservation Society (see FOOTPATHS). Others contend, however, that much common land could be usefully cultivated, and in 1955 a Royal Commission was appointed to consider its future status, control, and use. See E. C. Gonner, *Common Lands and Inclosure*, 1912; H. Bradley, *Enclosures in England, 1400-1900*, 1918; and pub. of Commons,

by the eminent trouvère Adam de La Halle. Late in the 16th cent. an aristocratic Florentine circle of musicians and literary men known as the *Camerata*, reacting against the current polyphonic musical style and attempting to revive the principles of Gk drama, began to write dramatic works in a new declamatory style—recitative. The leaders were the composers Peri and Caccini and the poet Rinuccini. The first known It. opera is *Dafne*, 1597, by Peri and Rinuccini; the first of which the music survives complete is *Euridice*, 1600, by the same collaborators; this libretto was set by Caccini 2 years later. A different approach was through the madrigal. Vecchi's *Amfiparnaso*, 1597, is a series of madrigals not intended for the stage, yet approaches dramatic form. The first great master of O. was Monteverdi, whose *Orfeo* was produced at Mantua in 1607. His madrigals had already gone a long way in dramatic



expression; he now enriched a dramatic text by greatly strengthening the orchestral and harmonic elements, and foreshadowed the later aria in his attempts at sustained melody. The distinction between recitative and aria became clearer in his successors, Cavalli and Cesti, but the balance of music and drama, always precarious throughout the hist. of O., became stilted; the lt. love of vocal and scenic display usurped the functions of dramatic characterisation. The subjects were still generally classical or historical, but comic episodes were introduced as a diversion.

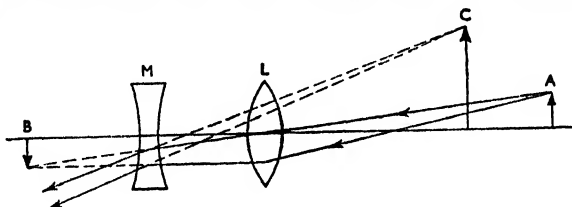
In 1637 the first O. house was opened at Venice. O. soon spread to other lt. tns, then to Paris (c. 1645), later to Vienna and Germany, where it remained Italian at the courts but was to become partly German at Hamburg about 1680. The Fr. O. was founded in 1669 by the poet Perrin, and the first important Fr. O., *Pomone*, by Perrin and Cambert, was produced there in 1671. But it was the Italian Lully who, incorporating the native ballet, estab. the tradition of Fr. Grand O., continued in the next cent. by Rameau. Lully worked under the patronage of the court, which his O.s were designed to glorify. In England the foundations of a native O., based on the masque, were laid by the composers who contributed to *The Siege of Rhodes* in 1656, and consolidated by Purcell, whose early death, however, left *Dido and Aeneas*, 1689, as a solitary pointer to the Eng. O. that might have been, as important and as free of convention as Monteverdi before and Gluck after it. Elsewhere O. remained Italian in form, style, and language. By the end of the cent. the leading influence was the Neapolitan school under Alessandro Scarlatti, followed later by Porpora, Pergolesi, Cimarosa, and others. With the aid of the poets Zeno and Metastasio the form became rigidly standardised; Scarlatti was responsible for the *da capo* aria, the 2 kinds of recitative, *secco* (accompanied only by the harpsichord) for the rapid transaction of dialogue, and *stromentato* (accompanied by the orchestra) for more dramatic moments, the rejection of the chorus, and the separation of the monumental *opera seria* from the more racy *opera buffa*. Scarlatti himself with his great melodic and expressive powers was able to animate this style, but with lesser composers it soon deteriorated into empty vocal display. The lyrical and dramatic genius of Handel made the most of it, but could not preserve it because it was alien to his sphere of activity, and his most important dramatic experiments were made in his Eng. oratorios, which are really O.s in disguise with the great asset of a chorus. The important reforms of Gluck were in essence a return to the principles of Monteverdi. He opposed the tyranny of the singer, especially of the *castrato*, who always sang the chief male parts in lt. *opera seria*, and concentrated on dramatic expression and characterisation. His new style was first prominent in *Orfeo*, 1762, and fully developed in the O.s he wrote for Paris from 1774, in which

he adopted the Fr. emphasis on ballet and chorus. But Gluck had long cultivated the Metastasian type, together with Italians like Traetta and Jommelli, and the Ger. Hasse, as well as Fr. comic opera, which began to flourish in Paris by the middle of the cent. in the hands of Philidor, Monsigny, Grétry, and others. Meanwhile a popular O. of contemporary life with spoken dialogue had also appeared in various local forms: ballad O. in England (*The Beggar's Opera*, 1728), and *Singspiel* in Germany. At first a reaction from the classical-dynastic *opera seria* of the court, this led directly to the romantic and national O. of the next cent. The cosmopolitan Mozart wrote masterpieces in all the current forms: *opera seria* (*Idomeneo*); *opera buffa* (*Le Nozze di Figaro* and *Così fan tutti*); an intermediate type of Shakespearian scope (*Don Giovanni*); and *Singspiel* (*Die Entführung, Die Zauberflöte*); and made great advances in characterisation and orchestral detail. The Ger. romantic O. of Weber stems partly from Mozart and the *Singspiel*, partly from the ethical Fr. grand O. of the revolutionary period under Cherubini and Spontini (the Paris stage, continually dominated by foreigners, has always kept its tradition). Beethoven's *Fidelio* springs from the same stock. The distinctions between aristocratic and popular O. now began to disappear, and Paris became an important centre where Meyerbeer in grandiose political O.s and Auber in *opéra-comique* led from about the 1830's, presently joined by Offenbach in operetta. In Italy the singer still reigned supreme, but the brilliant wit and vivacity of Rossini and the melodic charm of Donizetti and Bellini give their O.s distinction. Ger. dramatic music is dominated by Wagner after the production of his *Rienzi*, 1842, and *Der Niegende Holländer*, 1843. Influenced by Weber, whose remarkable *Euryanthe*, 1823, is the source of sev. innovations generally attributed to Wagner, and also by the romantic Marschner and the ostentatious Spontini and Meyerbeer, he evolved a new form which he called music-drama. This has little in common with traditional O., and finds its closest parallel in the symphonic poems of Liszt—with the stage action and the musical thought closely interrelated. Wagner's genius, instrumental and symphonic as well as vocal and dramatic, thus found its perfect expression; but the conviction expressed in his many writings that he was revolutionising O. by returning to the principles of Gluck and Attic drama misled his successors. A misunderstanding of Wagner lies at the heart of the best later Ger. O.s such as Humperdinck's *Hänsel und Gretel*, Wolf's *Der Corregidor*, and the early operas of Richard Strauss. Meanwhile traditional O. progressed rapidly in Italy and France. Verdi, often crude but always vital at first, developed into a figure comparable with Mozart and Wagner, though quite different from either, until, in his last O.s *Otello*, 1887, and *Falstaff*, 1893, he reached a musico-dramatic balance on the highest level, such as it..

O. had not known since Monteverdi. The succeeding exponents of the *verismo* school, Mascagni and Leoncavallo, sacrificed musical values to dramatic sensationalism; and Puccini sometimes marred an individual musical and dramatic talent by crudely assaulting the emotions of his audience. In France the striking if imperfect dramatic genius of Berlioz has always been neglected. Gounod attempted, only with partial success, to bridge the gap between the outworn conventions of Fr. grand O. and *opéra-comique*. His work is too often sugary and sentimental. Bizet's original genius rarely fell into these faults and achieved much that was striking in detail before he produced a masterpiece unique of its kind in *Carmen*, 1875. The many operas of Massenet and Saint-Saëns are more notable for craftsmanship than creative power. Debussy's single O., *Pelléas et Mélisande*, 1902, is a work of impressionistic suggestion that has found no true

Troilus and Cressida, 1954, has also been hailed in the U.S.A. and on the Continent of Europe as being in the main the line followed by such masters as Verdi and R. Strauss. Vaughan Williams, Bliss, Berkeley, Tippett, Bush, and others have also made O. part of their endeavour. See R. A. Streatfeild, *The Opera* (5th ed., revised by E. J. Dent), 1925; F. Howes and P. Hope-Wallace, *A Key to Opera*, 1939; E. J. Dent, *Opera*, 1940; D. J. Grout, *A Short History of Opera*, 1947; G. Kobbé, *Complete Opera Book*, 3rd revised ed., 1954; E. Newman, *Opera Nights* (new ed.), 1956.

**Opera Glass**, or **Galileo's Telescope**, instrument used for obtaining a magnified image of some distant object. It consists essentially of 2 lenses, a converging lens as objective, and a diverging lens as the eye lens. The objective lens L would form a real inverted image B of the distant object A. But before this image is formed the rays fall on the diverging lens M,



RAY PATH OF A GALILEAN TELESCOPE

successor. Russian O., largely founded on a rich folk-song tradition, began with Glinka and Dargomizhsky and reached its height in Mussorgsky's *Boris Godunov*, 1874. Borodin's *Prince Igor*, 1890, has an epic grandeur; Rimsky-Korsakov's O.s are remarkable for fantasy, melody, and orchestral colour, rather than characterisation. Tchaikovsky combined the native Russian with the Fr. and It. tradition. Czech O. was formed by Smetana out of folk-song and the Liszt-Wagner symphonic style; he was followed by Dvořák, whose gifts were more lyrical than dramatic, and Janáček, one of the most original opera composers with strong dramatic gifts, who aimed at a naturalistic utterance. Falla and Granados in Spain and Bartók in Hungary have made interesting experiments in O. Most remarkable of modern continental O.s is Alban Berg's *Wozzeck*, 1925, in which late romantic naturalism is combined with the atonality of the Schönberg school. In England the operettas of Sullivan were distinguished by wit, melody, and delicate scoring. In the early 20th cent. the strongest influences have been Wagner (Delius, Boughton) and folk-song (Holst, Vaughan Williams), and in the middle of the cent. Eng. O. suddenly blossomed out most remarkably. The strong dramatic gifts and musical virtuosity of Britten have made his already numerous O.s welcome all over the world, and Walton's

which renders them divergent so that they appear to come from the image C which is erect. C is the image which is seen by the observer. The fact that the image seen is erect, and that the telescope is comparatively small in size, makes it extremely useful as an O. G.

**Operation Overlord**, see **OVERLORD**.

**Operation Sealion**, the Ger. plan for the invasion of Britain, 1940. Ger. plans for invading Britain, begun in Nov. 1939, were intensified in July 1940, when Hitler was faced with the first major check to his strategy. Seeing that Britain showed no signs of coming to terms, he decided to undertake a landing operation, and the Ger. staff were given until mid Aug. to prepare it. The Ger. leaders, who were apprehensive of the proposed operation through fear of the R.N., thought it essential that the Ger. Air Force should accept the double role of both destroying the R.A.F. and preventing the Brit. Navy from attacking a landing force, and Goering (q.v.) was confident that the Ger. Air Force would be equal to these tasks. But later orders showed that Hitler was most reluctant to take a final decision, though on 3 Sept. directives were issued to prepare for embarkation at Rotterdam, Antwerp, and Le Havre, and D-Day was fixed for 21 Sept. Hitler, however, postponed the operation, and on 12 Oct. the invasion was called off until the spring, the fact being that the battle of

Britain had resulted in the failure of the Luftwaffe to carry out the first of its tasks, the destruction of the R.A.F. In July 1941 Hitler again postponed the operation until the spring of 1942 on the assumption that by that time the Russian campaign would be completed. The project does not seem to have been seriously considered again, and was finally cancelled in Jan. 1942.

It was widely believed in Britain that a Ger. invasion attempt was actually launched in 1940, but this is officially stated to be a fallacy. The official Brit. statement on Ger. plans, made in the House of Commons on 18 Nov. 1946, was based on captured Ger. documents and interrogation of Ger. prisoners of war (see *Itansard*, 18 Nov. 1946). It would appear that there was little enthusiasm amongst the Ger. naval chiefs for 'Sealion', and no real understanding by the army of the difficulties inherent in cross-Channel invasion. See A. Martiensen, *Hitler and his Admirals*, 1948, and P. Fleming, *Invasion 1940*, 1957.

**Operational Calculus.** In mathematics 'operations,' such as addition, subtraction, integration, differentiation, etc., are represented by symbols. During the 19th cent. it was realised that the symbols or 'operators' were themselves susceptible to manipulation, irrespective of their operands. An example of such a calculus is the electric circuit theory developed by O. Heaviside. Heaviside's methods were at first looked on with suspicion by the purists, as being not rigorous enough, but his work was of great practical application, especially in electrical engineering, and the O. C. has now been reconciled with other theories such as the calculus of finite differences and been shown to derive logically from the earlier Laplace transformations. See N. McLachlan, *Theory of Complex Variables*, 1939, and *Modern Operational Calculus*, 1948.

**Opercularia**, genus of Australian herbs or sub-shrubs (family Rubiaceae) with small globular heads of white flowers. *O. aspera* and *O. hispida* are sometimes grown in greenhouses, requiring a soil composed of equal parts of sandy loam, fibrous peat, and leaf soil.

**Operculum** (Lat., 'a lid'), in botany, the term which is used in speaking of the lid of the capsule of mosses. It forms a cover for the peristome, and falls off when the spores are ripe. In fishes (q.v.) it is the cover over the gills.

**Opere operato**, ex, in theology, term introduced by the schoolmen to express the manner in which the sacraments are efficacious. Certain general dispositions may be necessary in the receiver, but it is not these dispositions which render the sacrament effective. Bellarmine says: 'When we say the sacrament confers grace *ex opere operato*, our meaning is that grace is conferred by virtue of the sacramental act, instituted by God to this end, and not by the merit of the minister or of the recipient.'

**Ophelia**, **Ophelia Acid**, see CHIRATA.

**Ophicleide** (Gk *ophis*, a serpent; *kleta*, a key), obsolete brass wind instru-

ment of the bassoon type, but more closely related to the serpent, with a much coarser tone. It was patented by the Paris instrument maker Halary in 1821. It is unlike the bass horn and the Russian bassoon in being descended from the cornett family. It resembled the bassoon in shape, but was thicker and more uncouth, had 11 keys, a mouthpiece like that of the trombone, and a compass of about 3 octaves. Mendelssohn wrote for the O. in *Elijah* and *Midsummer Night's Dream*, but it is now obsolete and replaced by the tuba. Also a 16-ft reed organ pedal stop of powerful tone.

**Ophidia**, see SNAKES.

**Ophiolatri**, see SNAKE WORSHIP.

**Ophiopogon**, or **Snakeshead**, genus of perennials (family Liliaceae) with long narrow variegated leaves, and racemes of white or lilac flowers. *O. jaburan*, Japan, and *O. intermedius*, China, are nearly hardy.

**Ophir**, region celebrated in anct times for its fine gold and frequently mentioned in the O.T. From O. gold and precious stones were brought to Solomon. Its position has been the subject of much dispute. Suggested localities are Zimbabwe, in Mashonaland; Abhira, at the mouth of the Indus; Suhara, in Goa; Mt O., in Johore; and S. Arabia.

**Ophites** (Gk *ophis*, a serpent), or **Nasenees** (Heb. *nachash*, a serpent), early Gnostic sect which, in addition to the usual doctrines held in common with the other such groups, taught that special veneration should be paid to the serpent, the introduction of knowledge into the world being due to the serpent that tempted Eve. They are referred to by Hippolytus, Irenaeus, Origen, and other early Church writers. See GNOSTICISM.

**Ophiuroidea**, see BRITTLE-STARs and ECHINODERMATA.

**Ophrys**, genus of hardy terrestrial orchids with beautiful flowers, many of which bear a remarkable resemblance to insects. *O. apifera*, the bee orchid, is about a foot tall, and has 3 to 6 bee-like flowers in a loose spike. Other Brit. species are the fly orchid (*O. insectifera*) and 2 rare spider orchids.

**Ophrysia**, see PHEASANT.

**Ophthalmia**, inflammation of the eye. This term is not now in general use, the inflammation being related to the affected part or parts of the eye.

**Ophthalmology** (Gk *ophthalmos*, eye; *logos*, discourse), the science of the eye, its anatomy, physiology, visual functions, and diseases. See BLINDNESS; CATARACT; CONJUNCTIVA; EYE; GLAUCOMA; IRITIS; REFRACTION. ERRORS OF; TRACHOMA. See also J. H. Parsons and W. S. Duke-Elder, *Diseases of the Eye* (12 ed.), 1954; A. Sorsby (ed.), *Modern Trends in Ophthalmology* (third series), 1955; H. Neame and F. A. Williamson-Noble, *Handbook of Ophthalmology* (8th ed.), 1956.

**Ophthalmoscope**, optical instrument designed for examining the surface of the retina of the human eye, invented by Helmholtz (1851). Since his time many types of O.s have been designed (using

Helmholtz's basic principles), and with the modern instruments the structure and health of the cornea, aqueous, crystalline lens, vitreous, and retina may be investigated. An estimate of the refractive error of the eye may also be made with the O. There are 2 methods of viewing the retina, direct ophthalmoscopy and indirect ophthalmoscopy.

**Direct Method** (Fig. 1). The instrument will include in the handle the source of light, C, and behind the mirror D a battery or lenses will enable the observer A to focus the structures of the eye described above. In modern instruments it is usual to include a convex lens system between the source C and the mirror D, and the mirror D may then be a plane mirror.

**Indirect Method** (Fig. 2). In this method the source C is behind the eye B, and the mirror D will consist of a concave retinoscope and the light is focused by the convex lens E. By this method the

his subjects being Johnson, Burke, and Fox. He was also an historical painter. He became an associate of the Royal Academy in 1787, and in the following year a member. His tomb in St Paul's is near that of Sir Joshua Reynolds. His work, while not aiming at ideal beauty or refined poetical conception, is characterised by energy of style and vivid realism. His portrait of Mary Wollstonecraft Godwin in the National Gallery, London, well represents his style. See A. Earland, *John Opie and his Circle*, 1911.

**Opinicus** (heraldry), fabulous animal having the head and wings of a griffin or eagle, a short tail like that of a camel, and the body of a lion. It is sometimes represented without wings. It forms the crest of the Barber Surgeons of London.

**Opitz, Martin** (1597-1639). Ger. poet, b. Bunzlau, Silesia. In 1625 he was crowned poet laureate at Vienna by the Emperor Ferdinand II. A patent of nobility was

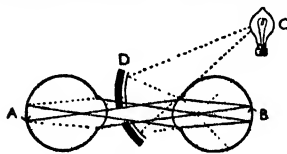


FIG 1. DIRECT METHOD: SELF-ILLUMINATED

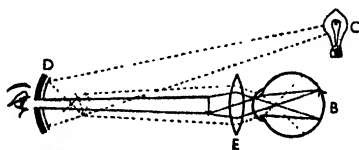


FIG 2. INDIRECT METHOD

observer A may only view a small magnified area of the retinal surface. Other parts of the eye may not be examined by this method.

Ophthalmoscopy enables the practitioner to observe the only part of the vascular system functioning which can be made visible, hence its extreme importance in diagnosis of the health of the eyes and the whole body. An adaptation of this instrument enables one observer to use both eyes with a binocular O.; another permits a number of observers to receive demonstration of a specific eye; incorporation with a camera enables photographs of the retinal fundus to be taken.

**Opie, Amelia, née Alderson** (1769-1853), novelist, b. Norwich. Her husband was John O. (q.v.), the painter. She pub. *Simple Tales* in 1806, and many novels, including *The Dangers of Coquetry*, 1790, *Adeline Mowbray*, 1804, and *Valentine's Eve*, 1816. See C. L. Brightwell, *Memoir of Amelia Opie*, 1855, and J. Menzies-Wilson and H. Lloyd, *Amelia: the Tale of a Plain Friend*, 1937.

**Opie, John** (1761-1807), painter, b. Harmony Cot, near St Agnes, Cornwall, son of a carpenter, whose real name was Oppy. He evinced such skill in taking portraits that Dr Wolcott (better known as Peter Pindar), the Truro physician, took him into his house and afterwards (1780) to London. He soon became famous, and in 1783 received a commission from the king, and advanced rapidly as a fashionable portrait painter, among

conferred on him in 1629, in the title of von Boberfeld. He became historiographer to Ladislaus IV of Poland in 1638. His poems (*Teutsche Poemata*, *Welliche Poemata*, *Geistliche Poemata*) tend to be didactic, cold, and formal. In his *Büchlein von der Poeterei*, 1624, he stresses the importance of clarity and adherence to rules. See studies by F. Gundolf, 1923, and H. Marx, 1931.

Opium is obtained by drying the juice of the unripe capsules of the poppy (*Papaver somniferum*). The plant is extensively cultivated in India, Asia Minor, Egypt, Persia, and China. Sown in Nov. in rich loose soil, the poppy-heads are ready to be operated upon by the end of Feb. O. has a bitter nauseous taste, and a heavy narcotic odour. Its properties as a drug are due to the alkaloids which it contains, viz. morphine, narcotine, thebaine, papaverine, codeine, etc. These alkaloids are either free or combined with such acids as meconic, lactic, or phosphoric. O. also contains gum, saccharine matter, fat, and water. The habit of eating O. is very prevalent, especially in the Far E. Its use is usually begun to relieve pain or sleeplessness, and after a month's use the individual becomes a confirmed O-eater. If taken in excess O. poisoning is set up, and the victim suffers from dyspepsia and nervous attacks. After a large dose of O. the person lies in a state of coma. Respiration is slow and noisy, the pulse is often slow but full, and the eye pupils contract. The skin also becomes pale and livid, and covered with a cold perspiration.

For O. poisoning an emetic or coffee is given, and the patient is kept moving if possible. For smoking O. a pipe of peculiar construction is required, and the effects are much the same as in the case of O. eating. As a medicine, O. may be given for pain or sleeplessness. It is also used in cases of diarrhoea and sometimes to alleviate coughing. It is usually given in the form of laudanum, a tincture prepared by dissolving O. in dilute alcohol.

The O. traffic was formerly an important source of revenue to India, but stringent regulations have been introduced to stop it. O. is produced in India under licence from the gov., and production is now confined to the states of Uttar Pradesh, Madhya Bharat, and Rajasthan. Previously the cultivation of poppies under licence was also permitted in Himachal Pradesh, and a small quantity was grown in Bilaspur. The O. is bought from the cultivators by the gov. at fixed rates, and gov. responsibility is confined to (a) the control of cultivation through the licensing system and of production of O. at the gov. factories at Ghazipur and Neemuch; (b) the sale of a comparatively small amount to the state govs. after processing or purifying for medical or quasi-medical needs; and (c) the export of the balance to foreign countries for medical and scientific purposes. Cultivation and manu. are regulated by the Indian Opium Acts of 1857 and 1878, and the Dangerous Drugs Act, 1930, under the general control of the Union Ministry of Finance. In 1953-4 the area engaged for poppy cultivation totalled 52,887 ac.; the total value delivered by cultivators in Uttar Pradesh, Madhya Bharat, and Rajasthan to the gov. in 1953-4 was £1,147,272 (Rs. 15,297,631). Exports were principally to the U.K. and the U.S.A., also to France, Argentina, Italy, and Belgium. Formerly most of the exported O. went to China, but in 1906 the Chinese Gov. prohibited the use of O. in schools and the army, and ordered all *habitues* to be registered and their allowances gradually decreased. In 1907 the Indian Gov., in furtherance of the efforts of the Chinese Gov. to suppress the cultivation and use of O. in China, decided gradually to reduce the amount exported to China, and as from 1917 its export was entirely prohibited. In 1928 the gov. of India announced its intention to restrict the export of O. otherwise than for medicinal purposes. Exports of provision O. to foreign countries ceased at the end of 1935.

In 1948 the Permanent Central O. Board in Geneva expressed grave concern at 'the presence of Iranian opium in the illicit traffic in many parts of the world.' In 1949 the World Health Organisation convened a conference of E. Mediterranean countries on the subject. O. is an important crop in Turkey, in the Ayvon Karahisar and Konya dists. In its report for 1955, made to the Economic and Social Council of the U.N., the Permanent Central O. Board said that O. was still the main element in the illicit consumption of narcotics. There were millions of addicts,

morphine and heroin used by addicts.

**Opium War**, name given to hostilities between Great Britain and China in 1840, following the destruction of Brit. ships taking opium to China. The war resulted in the cession of Hong Kong and the treaty ports.

**Opole:** 1. Prov. (*województwo*) of SE. Poland, bordering in the S. on Czechoslovakia. It is crossed SE.-NW. by the fertile valley of the Oder (q.v.), and in the S. has foothills of the Sudetic Mts (q.v.). The Silesian Neisse (q.v.) waters the W. of the prov. Until 1945 its ter. was in Ger. Upper Silesia (q.v.); the Ger. pop. was then expelled. Livestock is raised; cereals, potatoes, flax, and sugar beet are grown, and iron and other minerals are found. There are textile, leather, sugar, and engineering industries. Area 3635 sq. m.; pop. 850,000.

2. (Ger. *Oppeln*) City of Poland, cap. of O. prov., on the Oder, 170 m. SE. of Warsaw (q.v.). It was the cap. of a duchy, 1163-1532, and then passed into the hands of the Hapsburg (q.v.) family. In 1742 it went to Prussia. It is the seat of a bishop. There are textile, flour, machinery, and cement industries. Porphyry is found in the dist. Pop. 30,000.

**Opón**, tn of Mactán Is., Cebu, Philippine Is., opposite Cebu city. It is noted as the place where Magellan d. in 1521. Pop. 37,280.

**Oporto** (Portuguese *Pórtu*; anct *Portus Cale*), city of Portugal, cap. of Douro Litoral prov. and *Pórtu* dist. (qq.v.), on the Douro (q.v.), 3 m. from its mouth on the Atlantic, 175 m. NNE. of Lisbon. It is the second city of the country, and has been an important tn since the time of the Moorish supremacy. An outer harbour to take large vessels was constructed at Leixões, on the Atlantic 5 m. NW., in 1890. O. is built in terraces on the steep N. slopes of the rocky Douro gorge. It is connected to the S. suburb of Vila Nova de Gaia (known for its wine storehouses and its 16th-cent. monastery of *Serro do Pilar*) by the 2-storeyed bridge of Dom Luís I., which crosses the riv. in a single span of 560 ft at a height of 120 ft; this bridge and another bridge higher up the gorge are the work of Eiffel (q.v.). The streets of the old tn are narrow and tortuous, with tall, painted and balconied, granite houses. There are sev. good modern boulevards, notably the Rua dos Clérigos, the streets of Santo Antonio and Santa Catarina, and the Rua das Flores. The city has many public squares, of which the prin. is the Praça da Liberdade, containing a bronze statue of Dom Pedro IV. The 13th-cent. Gothic cathedral (called *Sé*) has been badly modernised, but has a fine interior and contains a solid silver altar and retable. The church of São Francisco, near the Bolsa (Exchange), is a mass of beautiful carvings of the 15th and 16th cents. Other buildings of note are the 12th-cent. church of São Martinho, the modern law courts, and the city's most conspicuous landmark, the

Torre dos Olérigos (18th cent.), which is 246 ft high. There is a univ. (1911) and there are colleges of music and art. O. is famous for the wine which it exports (see PORT WINE). The wine trade, begun by Eng. merchants in the 17th cent., was encouraged by the Methuen Treaty (q.v.). In addition to wine the port has a trade in fruit, olive oil, and salt. There are foundries, and there are textile, sugar, pottery, glass, tobacco, paper, and food-stuff industries. Pop. 284,850.

**Opossum**, word derived from the Amer. Indians, and applied to the various members of the marsupial family Didelphyidae. Fossil forms have been found in different parts of the world. The O. is the only native N. Amer. marsupial. In habit all are arboreal, except *Chironectes minimus*, an aquatic species, and nocturnal; in diet they are carnivorous or insectivorous. The number of digits is invariably 5, and there are 50 teeth; the tail is usually long and prehensile, and the pouch is frequently absent. The chief genus is *Didelphys*, and consists of 23 species, varying in size from that of a cat to a rat. The commonest of these is *D. virginiana*, which occurs in the U.S.A. It has coarse, yellowish hair tipped with brown or black, a scaly tail, hairy at the tip, short legs, and a pig-like snout. The young are carried by the mother in her pouch. The young of *D. dorsigera* have the interesting habit of curling their tails round their mother's, and being borne about in this fashion. *Chironectes*, the water O., or yapock, has completely webbed feet, and lives upon fish.

**Oppeln**, see OPOLE.

**Oppenheim**, Edward Phillips (1866-1946), novelist, b. London. He was educ. at Wygoston Grammar School, Leicester. His departure from school for the family leather business is amusingly told in his autobiography, *The Pool of Memory*, 1941. Altogether O. wrote some 150 books and, besides being one of the world's most prolific authors, he was among the best writers of 'thrillers.' Trans. into most European languages, he was especially popular with Ger. readers until he exploited Ger. hostility to Britain. Books which were particularly favoured by his large public were *Mysterious Mr Sabin*, 1898, *The Double Life of Mr Alfred Burton*, 1914, *Mr Grex of Monte Carlo*, 1917, *The Double Traitor*, 1918, *The Great Prince Shan*, 1922, *Prodigals of Monte Carlo*, 1926, *The Channing Syndicate*, 1927, *The Glenlitten Murder*, 1929, *The Million Pound Deposit*, 1930, *Gallows of Chance*, 1934, *The Strange Boarders of Palace Crescent*, 1934, *Bird of Paradise*, 1936, *Dumb Gods Speak*, 1937, *A Pulpit in the Grill-Room*, 1938, and *Advice Limited*, 1939. He also collaborated in 2 plays: *The King's Cup*, produced at the Adelphi in 1909, and *The Eclipse*, at the Garrick in 1919. After the First World War he settled in S. France.

**Oppenheimer**, Sir Ernest (1880-1957), chairman of De Beers Consolidated Mines Ltd., and many other S. African and Rhodesian mining companies, and one

of the world's leading industrialists. He began his career at the age of 17 in the London office of A. Dunkelshuhler and Co., where he gained his early experience of the diamond world. In 1902 he was sent to S. Africa in connection with the firm's interests in Kimberley. In 1908 he was elected a member of the city council and became mayor in 1912, which office he held till 1915. He was largely responsible for the raising of the 2nd Kimberley Regiment at the outbreak of the First World War, and during the Second World War devoted himself to the service of the Red Cross and other welfare organisations. In recognition of the services rendered to S. Africa over a number of years he was knighted in 1921, and from 1924 to 1938 he sat as S. African party member for Kimberley in the Union Parliament.

**Oppenheimer**, John Robert (1904—), Amer. physicist, son of a Ger.-Jewish immigrant and successful textile exporter, b. New York. He graduated from New York's Ethical Culture School, where he had an intensive course in chem. At Harvard he studied under the physicist P. W. Bridgman and the philosopher A. N. Whitehead (q.v.). At 21 he went to England to study under Lord Rutherford and Sir J. J. Thomson at Cambridge Univ., and also went to Göttingen where he earned his Ph.D. at 23 with a brilliant paper on quantum mechanics, and concluded with still further study at Leyden and Zürich. From 1928 he taught science at the California Institute of Technology and the univ. of California, winning a great reputation, and developing at that univ. an outstanding school of theoretical physics. In Mar. 1943 he was chosen by the U.S. Army to head a new scientific laboratory from which emerged the first atomic bomb. O. became chief executive of a \$60,000,000 company with 4500 workers, including such eminent physicists as Enrico Fermi and Niels Bohr, though he had never even been chairman of a physics faculty. It was recognised, however, that apart from his knowledge of physics, he had the capacity to make people pull together and work at fever pitch. Subsequently he was appointed to a small board of 7 members to suggest U.S. policy on the future of atomic energy, and was responsible for much of the writing and many of the ideas in a resulting report which called for an international atomic development authority. He is president of the Amer. Physical Society, and director of the Institute of Advanced Study, near Princeton. In 1953 he was suspended by the U.S. Gov. from secret atomic research on the grounds of security.

**Oppert**, Julius (1825-1905), Ger. Assyriologist, b. Hamburg of Jewish parents. He made a special study of anc. Persian, and in 1847 pub. *Lautsystem des Altpersischen*. In 1857 he became prof. of Sanskrit at the School of Languages at the National Library in Paris, and in 1874 was appointed to the chair of Assyrian philology in the Collège de France. He was also employed on various philological

missions by the Fr. Gov. His main publs. include *Histoire des empires de Chaldée et d'Assyrie*, 1865 (with J. Ménant), *Documents juridiques de l'Assyrie et de la Chaldée*, 1877, *Le Peuple et la langue des Mèdes*, 1879, and *Trois mille ans de science chaldéenne*, 1896.

**Oppian**, author of 2 didactic poems in Gk hexameters. Modern criticism favours the view that the poems are by 2 writers of the same name. *Halieutica*, a poem of about 3500 lines, on fishing, dedicated to Aurelius and his son Commodus, was probably written by a native of Anazarba or Corycus in Cilicia, who flourished in the reign of Marcus Aurelius (161-80). *Cynegetica* (2150 lines), on hunting, is dedicated to Caracalla, which places its date after AD 211, and its author was probably a native of Apamea or Pella in Syria. Both works are ed. with trans. by A. W. Mair, 1928.

**Oppland**, inland co. of Norway, including the prosperous Gudbrandsdal valley, which runs to Lake Mjøsa, and the famous Jotunheimen mt range. The land is high to the N. and low to the S. Forestry and agriculture are of great importance; O. is also one of Norway's most popular holiday areas. Lillehammer is the cap. Area 9608 sq. m.; pop. 160,400.

**Ops**, Rom. nature goddess, wife of Saturn, and mother of Jupiter, symbolical of plenty and fertility, and protectress of agriculture. She shared her temples and festivals with Saturn, and on the Capitol she shared the honours with her son Jupiter. See also CYBELE.

**Opsonins** (Gk *opsōnēin*, to obtain food). The capacity of the white blood corpuscles to absorb and digest invading bacteria (phagocytosis, q.v.) was shown by Douglas and Sir Almroth Wright in 1903 to depend on the presence of O. in the blood serum; white corpuscles washed free from serum are unable to carry out phagocytosis. In addition to normal opsonin, which has a generalised action on all bacteria, special O. or bacteriotropins are formed against specific bacteria as a result of immunisation. The opsonic index of a patient is the ratio of the number of bacteria ingested by a white corpuscle in the patient's serum to the corresponding number for normal serum; it varies between about .5 and 2, being high in patients who have been immunised or are convalescing from a disease. See BACTERIA, *Immunity*.

**Optic Nerve**, see EYE.

**Optical Glass**, see GLASS.

**Optical Illusion**, see ILLUSION and MIRAGE.

**Optician**. An 'ophthalmic O.', according to the National Health Service Act of 1946, is a person having the prescribed qualifications in optics (q.v.), including the measurement of errors of refraction, in orthoptics, and in the fitting and supply of optical appliances. A 'dispensing O.' is a person having the prescribed qualifications for the fitting and supply of spectacles.

**Optics**, science that deals with the phenomena of light and vision. O. is usually divided into 3 branches: (1) physical O., for which see LIGHT; (2)

physiological O., see VISION; and (3) geometrical O., with which the present article is concerned. It is a matter of everyday experience that we cannot see round corners, a fact that suggests that light must in some sense travel in straight lines. The belief is strengthened by taking a number of opaque screens punctured by a small pin-hole and arranging them so that a straight line can be drawn from a source of light through the pin-holes to the eye. The source of light can then be seen, but if one of the screens is shifted slightly, no light enters the eye, showing that, to a very close approximation at least, light travels in straight lines. Refined apparatus shows that this is only an approximation, however (see DIFFRACTION), but for many practical purposes it is assumed that light does travel in straight lines, and the straight lines of light are called rays of light. When light strikes the surface separating 2 media, one or both of two things may happen: viz. (1) the light may be reflected at the surface; (2) the light may be refracted into the second medium (in each case some absorption of light takes place). The 2 laws governing the first of these events are known as the *Laws of Reflection*: (a) the incident ray, the reflected ray, and the normal to the reflecting surface at the point of incidence lie in the same plane; (b) the angle of incidence is equal to the angle of reflection where the angles of incidence and reflection are the angles that the directions of the rays make with the normal at the point of incidence. The *Laws of Refraction* are: (a) the incident ray, the refracted ray, and the normal to the surface separating the 2 media at the point of incidence lie in the same plane; (b) the ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant for 2 given media and is known as the refractive index of the second medium relative to the first. The ratio is actually the ratio of the velocity of light in the first medium to its velocity in the second (the ratio varies for different coloured lights).

The function of geometrical O. is to reduce the behaviour of all types of mirrors, plane, spherical, paraboloidal, etc., and of all types of refracting bodies, plane, spherical and cylindrical surfaces, lenses, prisms, and systems of lenses, to simple, general terms derived from the application of the laws of reflection and refraction to the case under discussion, making use of the propositions of Euclidean geometry. Some of the results are summarised below.

**Plane mirror**. The image of a point is as far behind the mirror as the object is in front of it, and the line joining the object and image is normal to the mirror.

**Spherical mirror**. If the radius of the sphere of which the mirror is a small portion is  $r$ , then the position of the image of a point object on the axis of the mirror

is given by the equation  $\frac{1}{v} + \frac{1}{u} = \frac{2}{r}$ , where  $u$  is the distance of the object from the mirror, measured along the axis, and  $v$  is

the distance of the image from the mirror, measured along the axis. All these distances are reckoned positive if measured in the direction opposite to the incident light, negative if measured in the same direction as the incident light. (Convention of signs.)

**Spherical lens.** The position of the image of a point on the axis of a lens is given by the equation

$$\frac{1}{v} - \frac{1}{u} = (\mu - 1) \left( \frac{1}{r_1} - \frac{1}{r_2} \right)$$

where  $v$  and  $u$  are respectively the distances of the image and object measured from the centre of the lens,  $\mu$  is the refractive index of the material of the lens relative to the surrounding medium,  $r_1$  and  $r_2$  are the radii of curvature of the front and back surfaces of the lens respectively. All the distances are measured in accordance with the convention of signs given above. See also REFLECTION, REFRACTION, and other articles on various branches of light. See E. Holmvard and F. Barraclough, *Heat, Light and Sound for Beginners*, 1931; R. A. Hous-toun, *Treatise on Light*, 1938; W. J. Humphreys, *Physics of the Air* (3rd ed.), 1940; B. K. Johnson, *Practical Optics*, 1947; W. E. Williams, *Applications of Interferometry*, 1950; R. A. Sawyer, *Experimental Spectroscopy*, 1951; C. Candler, *Modern Interferometers*, 1951; C. Curry, *Geometrical Optics*, 1953; L. C. Martin, *Geometrical Optics*, 1955.

**Optimism** (Lat. *optimus*, best), word having both a strictly philosophical and a popular sense. The well-known doctrine of Leibnitz, in his *Essais de Theodicée*, 1710, that 'everything is for the best in this best of all possible worlds,' may be taken as the extreme of the optimistic philosophical doctrines. Leibnitz did not mean that everything in the world was perfect; but while admitting the existence of evil he maintained that the monads, of which he believed the universe to consist, strive after ultimate perfection. Therefore of all the infinite number of possible worlds which presented themselves to the mind of the Creator, the existing one was the best possible. The evil which Leibnitz admitted to be in the world he divides into 3 kinds: metaphysical, physical, and moral. The explanation of the 2 first named, that one is unavoidable in a created being, while the other is a punitive and admonitory agent, is much more satisfactory than that of the last; it is that problem which Leibnitz's system, like many others, fails to solve. The milder form of O., which believes that on the whole the universe is advancing towards a better state of things, is more properly called mellorism or evolutionism. Generally speaking, a teleological view of the universe connotes some form of O., which is found in conjunction with idealistic rather than materialistic theories. In the popular sense of the word O. means the belief that 'there is a soul of goodness in things evil,' and that whatever exists is right in some inscrutable fashion, or can be

made the means of good. Alternatively O. may simply mean the habit of 'looking on the bright side of things,' which naturally springs from a belief in the ultimate triumph of good. The opposite of O. is pessimism (q.v.).

**Optina Pustyn'**, former famous monastery in the Kaluga oblast of central Russia, founded in the 15th cent. In the 19th cent. it was a much visited centre of the activities of the Startsev (see STARETS), who exercised strong influence on Russian spiritual and intellectual life.

**Optional Clause**, otherwise Article 36, paragraph 2, of the Statutes of the Court of International Justice (see also INTERNATIONAL COURT OF JUSTICE). The statutes, in the original draft, gave the court compulsory jurisdiction in certain classes of disputes as between all members of the League of Nations, the chief of which concerned the interpretation of treaties, any question of international law, and the nature or extent of reparation for the breach of an international obligation. But in the final draft there was substituted a clause which members could adopt by declaring that they would recognise as compulsory *ipso facto* and without special agreement, in relation to any other member accepting the same obligation, the jurisdiction of the court in the above noted classes of disputes. This is the O. C. In 1940 there were 38 states adherent to the O. C. (Germany did not renew her signature, and Japan withdrew from the court in the same year), including Great Britain, the dominions, and other leading countries. In 1940 Britain renewed for a further 5 years its acceptance of the jurisdiction of the permanent court, under the same reservations as previously, and with the further reservation that it was not prepared to accept the court's jurisdiction in disputes 'arising out of events occurring at a time when His Majesty's Government are involved in hostilities.'

**Opuntia**, **Prickly Pear**, family Cactaceae, a genus of over 200 species found in the Americas; often large shrubs or trees, spiny stems, and short tubed, yellow or red flowers. Some species, transplanted to S. Africa and Australia as fencing subjects, became obnoxious weeds, now controlled biologically by a small parasitic insect; de-spined and processed, O.s may be used for cattle fodder. A few species are grown as ornamental plants indoors.

**Opus** (Lat. 'work'). Its abbreviation Op. is used as a prefix to enumerations of a composer's works. Its It. equivalent, *opera*, at first had the same meaning, but is now used almost exclusively in its later specific sense.

**Opus Signinum**, common form of Rom. floor or pavement made of cement with which is incorporated crushed brick or tile.

**Opwijk**, tn in the prov. of Brabant, Belgium, 11 m. NW. of Brussels; mainly engaged in agriculture. Hops and flax are largely cultivated. Pop. 8800.

**Oracle**, see ATRIPLEX.

**Oracle** (Lat. *oraculum*, from *orare*, to speak), place at which a deity answers the questions of his votaries through the mouth of his inspired minister, or the



response given. Recourse to O.s is found among most of the nations of the ancient world, but the practice is specially studied with reference to the Gk examples. Such methods of divination include: (1) that which depends on an examination of certain phenomena interpreted according to rule; (2) that in which the O. is delivered in trance or frenzy by an inspired priest or priestess; (3) direct revelation in dreams, or by intercourse with spirits. To the first class belong all methods of divination by animals and the examination of their entrails when sacrificed. The second class was also common in Greece, though few of the oracular shrines were really famous. The best known, then as now, was the O. of Apollo, at Delphi, which appears to have been a sacred place at least from the 2nd millennium bc. Questions were put to the Pythia (priestess) by a male prophet who also recorded the answer, usually in hexameter verses. The Pythia herself delivered these answers in a state of frenzy induced by some unknown means, and not, as was once supposed, by vapours rising from the earth. O.s are frequently used in primitive societies. For a detailed account of one such, see E. E. Evans-Pritchard, *Witchcraft, Oracles, and Magic among the Azande*, 1937; H. W. Parke and D. E. W. Wormell, *The Delphic Oracle*, 2 vols., 1956. See also DIVINATION.

**Oradea**, formerly *Grosswardein*, tn of Rumania, cap. of prov. of Oradea, near the Hungarian border; until 1918 part of Hungary. O. lies on the Cris, 80 m. WNW. of Cluj. It was ceded in 1940 to Hungary, and returned to Rumania after the war. Reputedly founded in 1080 by St Ladislaus, it contains an old fortress and many public buildings, including bishops' palaces, since it was the seat of Orthodox, Rom. Catholic, and Uniate bishops. Pottery making and distilling are carried on. Pop. (1948, mainly Magyar) 82,282.

**Oradour-sur-Glane**, Fr. vil. in the dept of Haute-Vienne, 12 m. NW. of Limoges (q.v.). It was the scene of an atrocity during the Second World War when 643 of its inhab. were massacred by Ger. troops. Alleging, without foundation, that an arms dump had been found there, the Germans, on 10 June 1944, shot all the men of the tn in a barn in batches of 20. The women and children were driven into the church, the doors of which were locked after a large case of explosives had been deposited inside. This case exploded soon afterwards and, when the building was in flames, Ger. soldiers heaped chairs and benches on the imprisoned victims, on whom the roof then collapsed. Meanwhile Ger. soldiers drenched all the houses and barns with some incendiary substance and set the whole place ablaze. The Bishop of Limoges condemned the atrocity and summoned the people of Limoges to a memorial service in Limoges Cathedral on 16 June. When the service, attended by thousands of people, was held, time bombs were discovered in the crypt of the cathedral. These had been put there by members of the Vichy militia. It is said

that the Germans had intended to burn not O.-sur-G., but Oradour-sur-Vayres, which is in a dist. where there was serious fighting between the men of the *maquis* (Fr. resistance forces) and the Germans.

**Oræfa Jökull** (the frozen mount of solitude), volcano, and the highest mt in Iceland, situated in the SE. of the country, and adjoining Vatna Jökull on the S. It reaches a height of 6952 ft. Eruptions occurred in 1341, 1362, 1598, and 1727. It was first ascended in 1891 by an Englishman, F. W. W. Howell. See his *Icelandic Pictures*, 1893.

**Orage**, Alfred Richard (1873-1934), Brit. journalist, b. Dacre, Yorks. Educ. privately, he was a teacher in Leeds till 1905, and came to London as a journalist in 1906. With Holbrook Jackson he took over the editorship of the *New Age*, which under his direction soon became a forum for the views of the best-known journalists, as well as for O.'s incisive weekly commentary. O. wrote 2 books on Nietzsche (*Friedrich Nietzsche: the Dionysian Spirit of the Age*, and *Nietzsche in Outline and Aphorism*), whose principles he applied to sociology in his propaganda for national guilds. After the First World War he became a protagonist of the Douglas Social Credit plan until he gave up the editorship of the *New Age* in 1922. For 2 years he lectured in America on literature and psychology, and on his return to England in 1932 founded the *New English Weekly*, in which he advocated financial reform on Douglas credit principles. An *Alphabet of Economics* appeared in 1917. See memoir by P. Mairé, 1936.

**Orakzais**, Pathan tribe of NW. Pakistan, inhabiting the mts of Tirah, on the Kohat border. Their origin is obscure. Risings among them were put down by the British in 1855, 1868, 1869, 1891, and by the Tirah expedition under Sir Wm Lockhart in 1897-8.

**Oran**: 1. Most westerly dept of Algeria, divided into the 4 arrons. of O., Mostaganem, Sidibel-Abbes, and Tlemcen. The dist. is fertile and rich in minerals. Area 23,450 sq. m.; pop. 2,173,700.

2. Cap. of above dept, a fortified seaport standing at the mouth of a small stream, at the foot of the Sainte Croix, 70 m. NE. of Tlemcen. It is a Fr. naval station and has a moderately good harbour, and there is an excellent one at Mers-el-Kebir, 3 m. distant. Most of the tn is modern and well built after the Fr. style. It is a centre of the wine industry, and has a large export trade in grain, wine and spirits, livestock, hides and wool, and esparto grass. The climate is healthy though hot. It was in the hands of Spain during 1509-1708 and 1732-92, when it was abandoned after being largely destroyed by earthquakes. It was occupied by France in 1831.

In July 1940, after the Hitler-Pétain armistice, the Brit. Gov. gave a 6-hr ultimatum to Fr. ships at O. They were offered, but rejected, conditions which were intended to prevent Germany and Italy from seizing them. A Brit. battle squadron under Adm. Somerville (q.v.)

attacked them, assisted by aircraft. One Fr. battleship was sunk and another damaged, one battle cruiser was damaged, and two destroyers and a seaplane carrier were set on fire and sunk. There were only slight Brit. casualties (3 July). The Pétain Gov. broke off diplomatic relations with Britain as the result of this action. On 6 July It. ships were bombed at O. U.S. troops landed near O. on 8 Nov. 1942. Pop. 299,018.

**Orang-outan**, or **Orang-utan** (*Pongo pygmaeus*, or *Simia satyrus*), member of the family Simiidae, which is found solely in Borneo and Sumatra. In colour it is



Mirrorpic

ORANG-OUTAN

tawny, and in height averages about 4 ft. The brachycephalic condition of the head is very marked, the fore-limbs touch the ankles when the animal is erect, both hallux and pollex are short, and the former is usually devoid of a nail; the dorsolumbar vertebrae are 16 in number. The O. is arboreal, and when on the ground it walks on the outside of its feet. During the night-time it sleeps in a nest which it builds in the trees. In habit it is solitary except during the pairing season, and in diet it is mainly frugivorous. See Winifred Felce, *Apes*, 1949.

**Orange**, House of, ruling family of a once independent principality now included in the dept of Vaucluse, France, and to-day occupying the throne of the Netherlands (q.v.). The male line of Gerald Adhemar (d. 1086) ended in 1174 when the heiress married Bertrand de Baux. Nine princes of his line followed one another until another heiress, Marie de Baux, married Jean de Châlons in 1393. His descendant, Philibert (1502-30), was an able soldier and

for his part in the campaign of Charles V was rewarded by the emperor with extensive possessions in the Netherlands. Philibert was succeeded by his nephew, René of Nassau-Châlons, whose father, Henry, Count of Nassau, had also enjoyed the emperor's confidence. René on his death in 1544 devised his titles and estates to his first cousin, William of O.-Nassau, famous in hist. as William the Silent. The princes of this line rendered service to the causes of Dutch independence and of Protestantism. William the Silent was assassinated in 1584. His great-grandson became William III of England; but on his death in 1702 the succession was disputed by the King of Prussia and John of Nassau-Dietz. The peace of Utrecht (1713) effected a compromise. The Prussian claim was abandoned, the ter. of O. was incorporated in France, and John was given the title Prince of O. In 1815 his descendant, William VI, became King of the Netherlands as William I. See M. E. Grew, *The House of Orange*, 1947.

**Orange**: 1. City of Essex co., New Jersey, U.S.A., 12 m. W. of New York. It is a favourite residential centre, and manufs. clothing, chemicals, brushes, auto accessories, cement and concrete products, electrical supplies, etc. Pop. 38,030.

2. Co. seat of O. co., Texas, U.S.A., on Sabine R., 90 m. N.E. of Galveston. Pop. 21,000.

3. Fr. tn in the dept of Vaucluse, near the Rhône and the Aygues, 13 m. N. of Avignon. A synod held here in 529 was of importance in the Pelagian (see PELAGIUS) controversy. It was the cap. of the co., later the principality, of O. from the 11th to the 16th cents.; in 1544 it passed to William the Silent (q.v.), and hence gives its name to the ruling family of Holland (see HOUSE OF ORANGE). It was taken in 1672 by Louis XIV, and was confirmed in Fr. possession by the treaties of Ryswick in 1697 and Utrecht in 1713 (qq.v.). There are notable Rom. remains, including a theatre, a triumphal arch, and an amphitheatre. Foodstuffs, textiles, brooms, and jewellery are manuf. Pop. 14,000.

4. Tn of New S. Wales, Australia, on the E. slopes of Mt Canobolas, 170 m. WNW. of Sydney. Farming is carried on, it is one of the best fruit-growing (cherries, apples, pears, plums, grapes, peaches, figs, etc.) dists. of Australia, and sheep are raised. Pop. 18,570.

**Orange**. *Citrus aurantium* is the Seville or Bitter O., its petals yielding the perfume, Oil of Neroli, and its fruit being used for marmalade; *C. bergamia*, the Bergamot O., the peel of which yields an essential oil for Eau de Cologne; *C. sinensis*, the Sweet O., *C. nobilis*, the King O., and its variety *deliciosa*, the Mandarin or Tangerine O., esteemed for their edible fruits. Having their origins in tropical Asia, O.s and hybrid fruits are now grown in many warm countries commercially, notably California and Florida of U.S.A., Brazil, S. Africa, W. Indies, and Spain. Being evergreen, they yield more or less continuously in suitable climates. In Britain they are chiefly grown for

ornamental purposes and the fragrance of their flowers in cool greenhouses, but will fruit if given sufficient heat.

**Orange Free State**, formerly a S. African Boer rep., now a prov. of the Union of S. Africa, bounded on the W. and S. by Cape Prov. (the Orange R. forms the S. boundary); on the N. by the Vaal R.; and on the E. by Basutoland and Natal. The high veld of the O. F. S., with the Transvaal, lies across the westward-sloping surface of the plateau of S. Africa, the Vaal and Orange R. system carrying the waters of the E. through the Kalahari desert to the Atlantic Ocean. Its surface mainly consists of undulating, grassy plains and plateaus, sloping towards the N. from the Drakensberg Mts in the SE.; to the E., on the Basutoland border, it is hilly. Generally speaking, the country lies at an altitude of 4000 to 5000 ft above the sea. It is watered by the Vaal and Orange R.s, with their tribs. the Modder, Caledon, etc. The climate is temperate and healthy, with moderate rainfall. Stock farming, to which the country is admirably suited, forms the main industry, sheep, cattle, horses, and pigs being largely bred. An increasing amount of land, especially in the E., is being devoted to agriculture, which receives every encouragement from the gov. There are over 250,000 ac. under wheat. Maize, potatoes, oats, fruit, and tobacco are also grown. There is considerable mineral wealth. Diamonds are found near Jagersfontein and Koffyfontein, and the produce averages over £1,000,000 in value annually. (In Jan. 1919 the find of a stone of 388 carats was reported.) Coal is mined just S. of the Vaal, and to a lesser extent in Vierfontein. Iron ores, gold (*see* ODENDAALSRUST), and salt are also found. Trade is mainly carried on with the U.K. Cottons, wool, leather and hides, diamonds, etc., are exported. During the Second World War diamonds, and particularly industrial diamonds, showed a decided boom, and the diamond mine at Jagersfontein is expected to reopen as soon as machinery is available. The cap. is Bloemfontein. Other important tns are Harrismith, Smithfield, Ladybrand, and Jacobsdal.

The prov. has an administrator aided by a prov. council of 25 members (elected for 5 years). There is an executive committee of 4 members. It sends 8 members to the Senate and 13 to the House of Assembly of the Union Gov. The O. F. S., like the Transvaal, has never extended the franchise to any but the white pop. Justice is administered under the Rom.-Dutch law. The prin. religious body is the Dutch Reformed Church. Education is free up to matriculation standard and compulsory up to the age of 16, but exemption may be granted in special cases or when a child has passed standard vi and is in regular employment. Unless parents object, the 2 official languages, English and Afrikaans, are taught to all pupils, the home language of the pupil being the chief medium of instruction and the second language being introduced gradually during the primary school course.

Higher and technical education are under the control of the minister of education for the Union, while primary (including elementary) and secondary education are controlled by the administrator of the prov. There are about 451 European public schools and about 11 aided private schools, with a total enrolment of 40,600 pupils; and about 548 non-European public and aided schools, with total enrolment of 61,300, and 4 training institutions for native teachers. Area 49,647 sq. m. The census of 1951 gave a pop. of 1,018,207 (European, estimated 1953, 238,000; non-European, 775,702; others, 7918).

**History.** The earliest Boer settlement on the N. of the Orange R. was made about the year 1828, after which came the Great Trek of 1835-6, when 10,000 people, following the refusal of the Brit. Gov. to agree to the extension of the colonial boundary to the Kei R. as a move against predatory Bantu, and also in consequence of the abolition of slavery, crossed the Orange R. to escape altogether from Brit. rule. These settlers, however, soon quarrelled with the Griquas, who were under the protection of the Brit. Gov., with the result that Sir Harry Smith, in 1848, annexed the whole country S. of the Vaal, an event which led to the Boers taking up arms under their old leader, Pretorius, who was defeated at Boomplaat in 1848, and then retired with some of his adherents to the N. of the Vaal. The ter. was then known as the Orange R. Sovereignty. The Brit. Gov., however, in view of increasing difficulties with the Basutos, abandoned the country in 1854, and its independence as the O. F. S. was confirmed at Bloemfontein in that year, much against the will of many of the inhab., who preferred Brit. rule. In the main the subsequent hist. of the O. F. S. was peaceable, but there was some fighting with the Basutos, and, eventually, the ter. of the Basutos was conquered and incorporated in 1869 by the treaty of Aliwal North into the O. F. S. The discovery of diamonds at Kimberley at this time and the consequent influx of diggers led to a dispute with the Brit. Gov. over the boundary of the O. F. S., which was settled in 1876 by a convention signed in London providing for a payment by Great Britain of £200,000 in commutation of the claim of the O. F. S. This convention was signed by Brand, whose moderation and statesmanlike qualities as president had won general recognition. In 1889, not long after his death, the O. F. S. entered into an alliance with the S. African Rep., which was renewed in 1897, and this alliance was appealed to as binding the O. F. S. to assist the S. African Rep. in her quarrel with Great Britain in 1899. The rep. took a prominent part in the S. African war of 1899-1902, and was made a Brit. crown colony (Orange R. Colony) in 1900. In 1907 responsible gov. was granted, and in 1910 the colony was merged in the Union of S. Africa as the prov. of the O. F. S.

**Native administration.** In the O. F. S. the native pop. in the reserves was never large and, despite immigration, it is still

far lower in proportion to Europeans than in any other prov. of the Union. Formerly there was a Dept of Native Affairs, but it was abolished in 1908, when native administration was entrusted to the colonial secretary's dept. From the outset it gave no general recognition to native law, though, by a special enactment, it acknowledged the legality of native marriages in the Thaba Nchu reserve and, by later enactments, a limited system of intestate succession derived from Rom.-Dutch law was introduced. Three chiefs have civil judicial powers, and 2 of these have criminal powers as well, in the native courts. The Native Administration Act, 1927, which gave these powers, also gave statutory recognition to native law in all provs. of the Union. This, though it obviated embarrassment arising from the previous limited recognition, was really in harmony with the political objective of segregation, and was directed less to the maintenance of native law for its own sake than to differentiating its field. There are 4 Native Reserve Boards, whose nominated members sit under the chairmanship of a magistrate, and derive their resources from the local tax imposed by the Natives Taxation and Development Act. There are to-day only 3 small reserves, one comprising lands assigned to Mopeli, a Basuto chief who submitted during the Basuto war of 1865-6; the others consisting of the remainder of the lands which the Basuto assigned in 1829 to a section of the Barolong which had been driven out of Bechuanaland: the latter were left in possession by the Voortrekkers in consideration of help rendered by them against the Basuto. As in other provs. of the Union there is a complicated system of pass laws. The regulations under the Native Administration Act, 1927, require the native to take out a pass to enter or travel within any 'pass area,' i.e. anywhere within the O. F. S. and Transvaal except native areas scheduled under the Native Land Act of 1913. The rigidity of the system is, however, mitigated by the issue of travelling passes by officials and owners of farms, and by the grant of exemptions. There are also in Bloemfontein and other large towns 'locations' for natives. Over 50,000 natives live in the Bloemfontein location and are said to live under as good conditions as any in the Union. The natives here have cinema shows, concerts, and meetings, a Y.M.C.A., a native dispensary, and an undenominational high school. There are also sev. well-laid-out sports grounds. It has been found that by establishing an advisory board, elected by the natives and to which all matters concerning the location are first referred, the natives have been brought to take a pride in the progress and orderliness of their native town. See A. H. Keane, *The Boer States*, 1900; J. H. Malan, *Die Opkoms van die Republiek of die Geskiedenis van die Orange Vrystaat tot die Jaar 1863*, 1929; H. J. Wikar, *Journals*, 1935; E. A. Walker, *History of South Africa*, 1935.

**Orange River**, riv. of S. Africa, rising

in the Mont-aux-Sources, Drakensberg, Basutoland, and flowing generally W. to enter the Atlantic in lat. 28° 38' S. It forms the N. boundary of Cape of Good Hope, separating it from the Orange Free State, Griqualand W., Brit. Bechuanaland, and Great Namaqualand. The chief tribs. are the Vaal and Caledon on the r. b., and the Hartbeest and the Zeekoe on the l. b. Its banks are well wooded, but much of the country through which it flows is desert. It is of little use for irrigation owing to the depth of its channel, and sand-bars, shallows, rapids, and falls make navigation impossible. Diamonds are found near the mouth of the O. R. and at various places along its 1100 m. course.

**Orange Society**, name of an Irish political society with the professed objects of the defence of the Protestant faith and succession. From the time of the Elizabethan settlements in Ireland there was bitter enmity between Catholics and Protestants, and this was intensified by the events connected with the rebellion of 1641 and the Williamite revolution of 1688-90 (see IRELAND, *History*). During the whole of the 18th cent. Ulster in particular was kept in a continuous state of ferment by this semi-religious, semi-political feud. In 1795, when the Protestant party was in the ascendant, the O. S. was formed (taking its name from William of Orange), and it worked to secure Protestant dominance wherever possible. It was organised as a secret society, arranged in lodges. During the 19th cent. it spread widely, having lodges not only in Ireland but also in Great Britain and the dominions, especially Canada. Its activities have sev. times caused Parliament to take action to restrain it. It was entirely suspended in Ireland from 1813 to 1828. The society keeps as high festivals the anniversaries of the battle of the Boyne (1 July) and the battle of Aughrim (12 July). See *Orangeism Exposed* (anonymous, New York, 1824; parli. report on the Orange Association, 1835; Lilburn, *Orangeism*, 1866).

**Orangeburg**, city of S. Carolina, and co. seat of O. co., 38 m. SSE. of Columbia. It is situated in a rich agric. region. The industries include oil and lumber milling, cotton, grain processing, meat-packing, and foundry and machine shop products. It is the seat of Claflin College and the S. Carolina Agric. and Mechanical College, both for Negroes. Pop. 15,322.

**Orangemen**, see ORANGE SOCIETY.

**Orangery**, building having large windows on its S. side, used for growing oranges. There are examples at the palaces of Hampton Court, Kensington, and Versailles (all built between c. 1680 and c. 1710).

**Oragul Stalin**, see STALIN (tn).

**Oratorio**, dramatic form of religious music for concert performance, consisting of solos and choruses, with instrumental accompaniment. The term, however, has been variously defined at different periods in different countries, and, in its beginnings, in the early 17th cent., it had

action, scenery, and costumes, while, sometimes, works not religious in character have been called O.s, evidently because they consisted of the solo, choral, and orchestral features of O. proper while yet not being operas, in that they were not intended for stage performance.

The origin of both the name and the form is usually traced to the oratory of St Philip Neri. About the middle of the 16th cent. this saint commenced a series of biblical lectures at the oratory. In order to make these more interesting, Animuccia, the master of the papal chapel, wrote settings for hymns, *Laudi spirituali*, to be interspersed throughout the lectures. It is probable, however, that the origin of the O., in Germany at least, is connected with the hymns and songs of the old miracle and mystery plays, and also with the usual method of singing the Passion gospel during Holy Week. Emilio de' Cavalieri's *Rappresentazione de anima e di corpo*, 1600, shows the very close affinity between the O. and the opera. Both were founded on the monodic system of harmony, and to this system the It. school adhered more closely than the German. The name of Carlissimi (d. 1674) is particularly important as a developer and exponent of the It. O., set to Lat. words. One of his O.s, *Jephtha*, is founded partly on the scriptural story of Jephtha's sacrifice of his daughter, but it has also lyrical rhymed passages for solo and chorus, and a narrator in the manner of a Bach Passion. In Germany the O. was from the beginning written round the Passion. Heinrich Schütz's (1585-1672) settings of the Passion prefigured Bach but they have a high value of their own. The Ger. school worked on the whole more closely in the polyphonic style of composition than the earlier It. had done. The form was raised to a great height by Bach (1685-1750), whose greatest composition of this kind appeared in 1729, the *Passion according to St Matthew*. The most important composer of O. during the 18th cent. was Handel, whose works in that form belong to the Eng. school, the most famous being *Messiah*, 1741. Other well-known O.s are Bach's *St John Passion*, 1720; Haydn's *Creation*, 1798; Beethoven's *Mourning of Olives*, 1814; Mendelssohn's *St Paul*, 1836, and *Elijah*, 1846; Berlioz's *Childhood of Christ*, 1854; Liszt's *St Elizabeth*, 1865; Franck's *Beatitudes*, 1879; Dvořák's *St. Ludmilla*, 1886; Parry's *Judith*, 1888; Stanford's *Eden*, 1891; Elgar's *Dream of Gerontius*, 1900, *The Apostles*, 1903, and *The Kingdom*, 1906; Honegger's *King David*, 1921; and Walton's *Belshazzar's Feast*, 1931.

Oratory, art of rousing the emotions and convincing the understanding of others by public speech according to the rules of rhetoric. It may be classified as political, forensic, and religious. The ancients experienced no strong religious passion, so that their O. was confined to the courts and the legislative assembly. Before Demosthenes the prin. orators of Athens were Lysias and Isocrates. The speeches alleged to have been delivered by Pericles and recorded by Thucydides are probably

the composition of the historian; yet some of them remain among the most moving utterances of hist. Demosthenes stands apart from and above all others. An eclectic in style, he achieved a synthesis which makes him still the leader of human eloquence to whom alone of the Athenians Aeschines yields the palm of O. At Rome the rugged eloquence of Cato, the Scipios, and the Gracchi gave way before the Attic influence. It has been said that a certain oriental strain marred the speeches of Hortensius; but the great forensic orations of his rival Cicero rank with, and, in the opinion of some, even surpass, the achievement of Demosthenes. As at Athens, so at Rome, the end of freedom marks the decay of eloquence. After the extinction of imperial despotism 2 causes hindered the rebirth of O. There was a lack of political and legal institutions, which have always been the nursery of eloquence, and language itself was undergoing a long and difficult transformation.

The Eng. language, together with the parl. tradition and the hallowed dignity of the Eng. courts, has fostered a high standard of O. The names of Lord Chatham, Pitt the younger, Charles Fox, Lord Brougham, Disraeli, and Gladstone adorn the 18th and 19th cents.; and the splendour of their debates was enhanced by the speeches of their Irish colleagues Edmund Burke, Henry Grattan, Richard Sheridan, and Daniel O'Connell. In France the voices of Mirabeau, Desmoulins, and Danton heralded and sustained the revolution. Later, in America, the outstanding representative of eloquence was Abraham Lincoln, whose Gettysburg speech is ranked by some critics with the greatest oratorical triumphs of the old world. The 20th cent. has experienced a decay of culture; and this decay has been marked by a lack of orators to interpret and control the portentous happenings of these 50 years. Two notable exceptions have been the impassioned demagoguery of Adolf Hitler and, more important, the parl. and broadcast speeches of Winston Churchill during the Second World War. These swayed the destiny not of a single nation but of the world. Eng. forensic O. has enjoyed an equal splendour and suffers a similar eclipse. The eloquence of Henry Hawkins, Edward Carson, Rufus Isaacs, and F. E. Smith remains the glory of the Eng. Bar and Bench. Religious O. reached its perfect flower in France. St Bernard of Clairvaux and Jean Gerson dominated the pulpit in the Middle Ages. The semi-political wranglings of the reformers were not fertile ground for the selfless passion which inspires the great pulpit orator; but from the 17th cent. onwards there arose a succession of preachers who, independently of the religious content of their discourses, rank with the finest speakers of the world. Bossuet, Bourdaloue, Fénelon, Massillon, and Lacordaire have no equals as exponents of the Christian faith and the duties of the Christian life. See also RHETORIC.

Oratory of St Philip Neri, Congregation of the, was founded in 1556 at the hospital

of San Girolamo della Carità, Rome, by the saint whose name it bears (see NERI, PHILIP, Sr). The society had at first no definite rules; but after the death of St Philip a constitution conformable to his spirit and intention was drawn up by the historian Baronius, one of his earliest companions. The Oratorians are priests living in community under simple vows terminable at any hour. The Oratory was introduced into England by Newman in 1847, the first house being at Maryvale, near Birmingham, later transferred to Birmingham itself. The Brompton Oratory is an independent offshoot of this.

A Fr. oratory was founded in 1611 by Cardinal de Bérulle, and called the Congregation of the Oratory of Our Lord Jesus Christ. The general intention was to strengthen eccles. discipline, and the rule was also adopted by the Oratory of the Immaculate Conception, founded in 1852 in Paris.

**Orbetello**, see ARGENTARIO.

**Orbigny, Alcide Dessalines d' (1802-57)**, Fr. naturalist, b. Couëron, Loire-Inférieure. He was appointed travelling naturalist to the Museum of Natural Hist., Paris; and in 1826-34 went on a scientific mission to S. America, embodying the results of his researches in zoology, palaeontology, and ethnology in *Voyage dans l'Amérique méridionale*, 1839-42. Among his other works were *Galerie ornithologique des oiseaux d'Europe*, 1836-8, the unfinished *Paléontologie française*, 1840-54, and *Prodrome de paléontologie stratigraphique*, 1850-2.

**Orbilius, Pupilius**, see PUPILIUS.

**Orbis Sensualium**, see COMENIUS.

**Orbit**, path traversed under the influence of gravitation by a heavenly body round its primary. In the solar system ellipses are traced by satellites round their planets, and by planets round the sun, the primary occupying one of the foci. The elements provided when an O. has been computed are the long. of perihelion, the long. of the ascending node, the inclination of the O., the eccentricity, the semi-axis major or mean distance, and the time of perihelion passage. The planetary O.s vary in eccentricity from 0.007 to 0.25, those of satellites from 0 to 0.76. Periodic comets move in elliptical O.s from about 0.11 to 0.9999 eccentricity; most comets move to nearly parabolic paths, while sev. trace a hyperbola. But all of these latter formerly moved in elliptic O.s, and were thrown into hyperbolic O.s by the perturbations of the major planets.

**Oreades**, Lat. for Orkney Is. (q.v.).

**Oreagna**, or L'Arcagnuolo († 1308-c. 1368), nickname (the archangel) of Andrea di Cione, Florentine painter, sculptor, and architect. His work is rich in colouring and ornamental in effect, though rather hard and conventional in execution. Among his masterpieces are the wall paintings in fresco and an altar-piece in the Strozzi Chapel, Santa Maria Novella, Florence; the frescoes in the Campo Santo at Pisa; the altar-pieces in tempera, 'The Coronation of the Virgin' (National Gallery, London); and in architecture,

the church and tabernacle of Or San Michele, Florence. He left sev. unfinished works, completed by his brothers Nardo and Jacopo.

**Orchard**, large or small plantation of fruit trees. Modern O.s consist of 'straight' plantings of apples, pears, plums, and cherries. Best soils for fruit are of a loam character, with certain types of sands or clays for second choice; no fruits do well in soils subject to water-logging or drying out. For apples, deep, sandy, gravelly, or clayey loams, with good draining subsoils, are best. For pears, medium to heavy loams. Plums do best on heavy to medium loams, and are more tolerant of wet soils than other fruits. Cherries like medium to light loams, and deep, well-drained soils. Soft fruits are less exacting and thrive on most soils, given adequate organic matter content. Land sloping to the S., W., or N. is preferable to that sloping to the E. Protection by windbreaks, natural or made, is needed on land fully exposed to the SW. Maximum sunlight in summer is essential. Elevation is important. High land is generally preferable to low, but the crucial factor is the movement of air currents. An O. should be sited and planted so that the heavy cold air can move through it easily to lower levels beyond. Frost pockets and narrow valleys should be avoided. A minimum rainfall of 20-25 in. per annum is needed for fruit crops. It is not good practice to plant O.s with 'filler' trees to be taken out some years later, and undercropping of tree fruits with bush fruits needs careful planning. A modern O. is planted for permanency from the start. Where circumstances dictate mixed plantings, gooseberries may be planted with apples, black currants with plums, cherries with plums, but not apples with plums or cherries, since soil and manurial requirements must be similar. Plums or damsons may be planted on the windward side of O.s. Raspberries, strawberries, and brambles are planted separately. Five systems of planting prevail: square, rectangular, diagonal, quincunial, and hexagonal. Spacing depends on type and habit of tree chosen. Gooseberries and currants may be planted at 6 ft apart (1210 trees per ac.); bush apples and pears at 12 ft apart (302 trees per ac.); half-standard apples, pears, and plums at 24 ft apart (75 trees per ac.); and full standard tree fruits at 30 ft apart (48 trees per ac.). Land for fruit should be deeply ploughed, and the subsoil broken up if hard and panned. No manure is necessary for tree-fruit planting, except potash on light or deficient soils. Soft fruits should have dung or compost ploughed or dug in before planting. If drainage is needed drains should be laid after the orchard has been laid out, but before trees are planted. Drains should run between the rows of trees into the main drain. Actual planting is done in dry open weather from about mid Oct. onwards, but is best completed before Dec. Planting holes should be 9-12 in. deep, and 24-36 in. in diameter for tree fruits. Subsoil is broken up with

a fork, then a little top soil put back so that the tree is planted in good top soil entirely. Firm planting is vital, but ramming of the soil, particularly clays, is undesirable. All trees need staking; bush trees can be staked with stakes driven slantwise, pointing into the prevailing wind, standards and half-standards are best given 2 stakes about 18-24 in. apart on each side of the tree, with a cross-piece fastened to the tree, 12 in. below the branching head. The O. floor should be cultivated and kept free from weeds and grass until tree growth is well developed.

Grass orchards are less popular. Although stock such as poultry and sheep can be run under half-standard or standard trees, manurial treatment tends to become unbalanced. Grass has a starvling effect on tree growth, and O.s should not be planted direct in grass. When trees are well developed it is permissible to allow grass to grow over the roots, but it should be kept short by cutting or grazing with stock, and careful attention given to manuring and fertilising of trees. Sheep suit fruit best, as their excrement has a high potash content; geese are excellent, then poultry; pigs and cows are less suitable, since their excrement is less evenly distributed. Overstocking should be avoided, and the land rested from stock and limed periodically. Temporary cover-cropping of O.s with leguminous seed mixtures is helpful in building up organic content of soil. Intercropping of fruit with vegetables interferes with spraying programmes. Good regular yields of fruit depend largely on manuring. Broadly, dessert apples, red currants, and gooseberries need potassium mainly, supplemented by nitrogen and phosphorus; cooking apples, pears, cane fruits, and strawberries require potassium, but heavier supplements of nitrogen; while stone fruits, black currants, and nuts need plentiful nitrogen and moderate amounts of potassium and phosphorus. In practice, manuring must be related to pruning, cultivating, soil, drainage, and type and variety of fruit and tree.

**Orchard house.** A lean-to or span-roof glasshouse for the culture of fruit trees in pots should preferably be not less than 20 ft wide, 12 ft high at the ridge, and 6 ft at the side. All sides should be made to open panel-wise for free ventilation. Sufficient heating to nullify spring frosts in Mar.-April is desirable. Pot trees can provide a greater variety of fruit from a given space than outdoor trees. Fruit ripens 1 to 2 weeks earlier. Success depends upon management and attention to watering, syringing, top dressing, and feeding to maintain health and fertility. Apricots, figs, nectarines, and peaches can be kept constantly in the house. Apples, pears, and plums can be placed out of doors in a favourable situation from early June to early Feb. Currants, gooseberries, and cherries are best cropped under glass, and then put outside until early Feb. Trees should have been grown in pots from the time they were grafted or budded, and should be 3 to 4 years old, well furnished with fruit buds. Size of

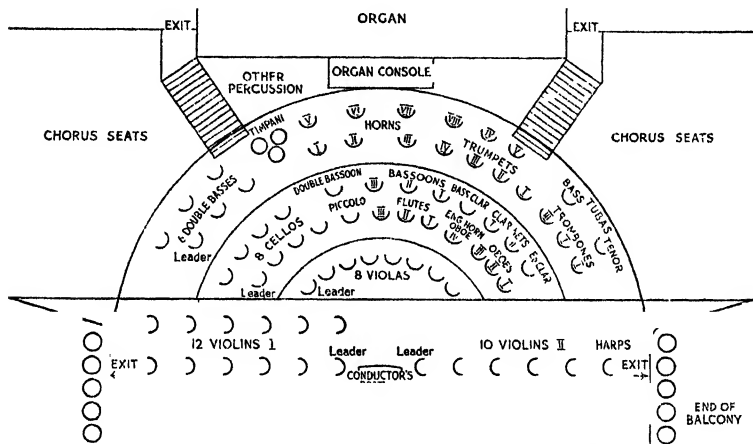
pots are 12-16 in. Trees are grown in a compost of 1 part by bulk each of coarse sand, leaf mould, rotted manure, mortar rubble, and 5 parts medium loam, plus 12 oz. bone meal and 6 oz. of a balanced fruit fertiliser to every barrowful of compost. Repotting is done in mid Oct., but is not necessary every year. Healthy trees need only a little old soil removed from the surface and sides, and replaced with fresh compost. Trees are wintered out of doors after watering well, and plunging to the rims of the pots in ashes. Pots are then covered with organic litter to keep frost out. In Feb. trees can be moved into the house. Indoor trees usually need pollinating by hand, using a rabbit's scut or camel-hair brush when flowers are open. Fruits should be well thinned, and all fruit trees in pots need careful pruning. Apples, pears, cherries, currants, and gooseberries are summer-pruned. In the case of nectarines, peaches, and plums, main shoots are cut back by one-half and laterals to 2 to 3 buds of their base.

**Orchardson, Sir William Quiller** (1835-1910), artist, b. Edinburgh. He first exhibited at the Scottish Academy in 1848. In 1862 he settled in London, where for some time he worked in close association with John Pettie (q.v.). He was elected A.R.A. in 1868, and in 1877 made R.A. In 1870 he visited Venice. He was knighted in 1907. His work is somewhat marred by too much emphasis on story-telling, but O. had genuine ability as a painter. Among his best-known pictures are 'Challenged,' 1865, 'Ophelia,' 1874, 'A Venetian Fruit-seller,' 1874, 'Flotsam and Jetsam,' 1876, 'The Queen of the Swords,' 1877, 'Hard Hit,' 1879, 'Napoleon on board the *Bellerophon*,' 1880, 'The Young Duke,' 1889, and 'Her Mother's Voice,' 1888. He was also a popular and successful portrait painter.

**Orchestra**, body of instrumental players performing in a theatre or concert hall. The term originally meant the semicircular space in front of the stage in the ant. Gk theatre where the chorus danced and sang; it has been transferred from the place to its occupants. The modern O. did not begin to evolve till about 1600. At that period the same music was often performed indiscriminately by voices and/or instruments; many books of madrigals are described as fit for viols or voices. The small instrumental groups were generally confined to the same family, e.g. the consort of viols or recorders, and they played what we should call chamber music. Wind bands existed, and trumpets and drums for military and ceremonial use. There were no public concerts before the 18th cent.; the O. developed in the theatre, the church, and the court (Louis XIV of France kept a band of 24 violins, imitated by Charles II of England). Of these the theatre was the most important because it encouraged experiment. In his opera *Orfeo* (1607) Monteverdi used an O. of strings, woodwind, brass, harp, 2 harpsichords, and 3 organs, with other optional instruments, e.g. lutes, and put orchestral colour

deliberately at the service of dramatic effect. About the same time Giovanni Gabrieli at Venice extended the antiphonal principle from vocal to instrumental music, and wrote works for 2 groups of instruments (or O.s.), contrasting the sonorities of strings and brass. But progress was not consistent. During the 16th cent. the violin family replaced the viols, and the centre of the O. became the strings. They were always supported by a keyboard instrument (generally harpsichord or organ), which played the bass line and added any harmonic filling required, more often than not prescribed by the composer in a figured bass. The

woodwind, and brass, supported by percussion. The first violinist was now the true leader of the O. In addition to pairs of flutes, oboes, clarinets, and bassoons, 2 (occasionally 4) horns had been introduced; and in Beethoven's fifth Symphony the 3 trombones completed their transition from the church to the concert hall via the theatre. Big drum, cymbals, and triangle were used for special effects (known as Turkish music); so was the piccolo, and a little later the cor anglais, while the harp returned from long exile. The wind bass was supplied by the ophicleide and double bassoon, and from about 1860 by the tuba, which ousted the ophicleide. By 1815



PLAN OF A SYMPHONY ORCHESTRA, SHOWING THE ARRANGEMENT OF INSTRUMENTS AND PLAYERS

keyboard player, who was often the composer, directed the performance (there was no conductor in the modern sense); next in importance were the leaders of the first violins and the basses, who took their position beside the keyboard. Oboes, bassoons, and flutes (more strictly recorders) won a place in the O. of Lully (1632-87) and Purcell (1659-95), and trumpets and drums were introduced for special effects; but the wind instruments often had little to do except reinforce the O., and flutes and oboes were generally played alternately by the same players. The period of Bach and Handel saw the rise of the concerto, and the use of one or more solo instruments, either in contrast to the main orchestral body or to supply an *obbligato* in a vocal work. The operas and oratorios of Handel not only introduced sev. additional instruments, but explored fresh ground in orchestral sonorities. The modern O. did not emerge till about 1800. The keyboard player had dropped out of the later O.s of Haydn and Mozart, and the instruments became standardised in their 3 groups of strings,

the application of the valve to horns and trumpets greatly extended their range, by giving them a full chromatic scale, and thus the power of the whole O. During the romantic period O.s increased rapidly in size, and composers turned more and more to exploit the mounting possibilities of instrumental colour. This process reached its height in the works of Berlioz and Wagner, who himself added new instruments, and was carried to excessive lengths by Strauss, Mahler, and early Stravinsky. In France special prominence was given to the cornet (taken from the military band) and the instruments of the saxophone family. A later movement, led in part by Stravinsky himself, favoured smaller O.s. and the economic conditions of two world wars were partly responsible for the frequent use of chamber O.s. Experiments have been made in the introduction of electric instruments, such as the Ondes Martenot (see ONDES MUSICALES).

To the growing complexity of the O. is due the rise of the modern conductor, a 19th-cent. phenomenon developing out of



the violinist leader. Weber in 1826 used a roll of paper, and others a violin bow, but soon the baton came into use. The interpreter-conductor was largely the creation of Wagner. In earlier times a heavy baton had sometimes been used simply to beat time (Lully *d.* as a result of injuring his foot with one). Early in the 19th cent. control of orchestral music began to pass from the court to the middle classes, and public concert societies were founded. The Leipzig Gewandhaus already existed; the London Philharmonic Society was founded in 1813, the Paris Société des Concerts du Conservatoire and the Munich Odeon-Concerte in 1828. Many others followed. The number of permanent O.s increased rapidly after the middle of the cent., especially on the continent and in the U.S.A. Until this cent. Britain was backward in this respect, but is now well supplied by the London Symphony, London Philharmonic, Royal Philharmonic, Philharmonia, and the various O.s associated with the B.B.C., besides a number of prov. O.s, of which the Hallé in Manchester is the most distinguished. See C. Forsyth, *The Orchestra in the Eighteenth Century*, 1940, and *The Orchestra from Beethoven to Berlioz*, 1949; F. Howes, *Full Orchestra*, 1942; A. Carse, *The Orchestra*; R. Nettel, *Orchestra in England*, 1956.

**Orchids** (Orchidaceae), family of over 15,000 monocotyledonous perennial herbs, of world-wide distribution, most abundant in the tropics. Those of tropical regions are mostly epiphytes, those of temperate regions mostly terrestrial and apparently depend on association with mycorrhiza for successful growth. A few species, lacking chlorophyll, are saprophytic, and get their nourishment from the humus forming matter in which they grow. In Britain some 22 terrestrial genera are found, among which are *Neottia* (Bird's-nest Orchis); *Listera* (Twayblade); *Spiranthes* (Lady's Tresses); *Epipactis* (Helleborine); *Aceras* (Man Orchis); *Ophrys* (Insect Orchis); *Hermione* (Musk Orchis); *Platanthera* (Butterfly Orchis); *Cypripedium* (Lady's Slipper); and 12 species of *Orchis*; all small, pretty, and interesting to grow along with other temperate species in rock gardens, borders, or shady greenhouses or frames. Many beautiful O. can be grown easily in small greenhouses, and culture need not be expensive. O. are grown commercially for their flowers: *Vanilla fragrans* is a source of the vanilla pods of commerce, and the tubers of some *Orchids* were once exploited as a source of salep, a nutritious drink. There are over 600 genera, some of which are described under their names. See C. Darwin, *The Fertilisation of Orchids*, 1862; W. Watson and H. J. Chapman, *Orchids, their Culture and Management*, 1903; C. H. Curtis, *Orchids*, 1950; R. T. Northern, *Home Orchid Growing*, 1950; B. S. Williams, *Orchid Growers' Manual*, 1952; D. Sanders and E. Cooper, *Orchids and their Cultivation*, 1954.

**Orchil**, or **Orchella**, see **ARCHIL**.

**Orchomenus**, 2 cities of ancient Greece: (1) in Boeotia, on R. Cephissus. (2) In

Arcadia, lying N. of Mantinea, W. of Stymphalus. Both were important till the 5th cent. BC.

**Oreus**, Lat. name of the nether world and its god, corresponding to Hades and Pluto respectively.

**Orozy**, **Emmuská**, **Baroness** (1865–1947), Brit. novelist, b. Tarnaörs, Hungary, daughter of Baron Felix O. She studied painting in London, and exhibited at the Royal Academy. In 1895 she pub. her novel, *The Scarlet Pimpernel*, first written as a play in collaboration with her husband, Montague Harstow, son of a Yorks clergyman, and followed this with more than 40 novels of a similarly romantic character, chiefly of the period of the Fr. Revolution, including many 'Pimpernel' sequels, such as *The Elusive Pimpernel*, 1908, most of which had a great vogue. Her writings included essays, historical novels, and detective stories. *Links in the Chain of Life*, 1947, is an autobiography.

**Ordnaires**, **Lords**. In 1310 a committee of barons set up a body of 21 peers, the Lords Ordinaires, in an effort to control Edward II. After 18 months' deliberation they put forward proposals for future gov., known as the 'ordinances' of 1311. See also **EDWARD II**.

**Ordeal** (O.E. *ordāl*, *ordael*, judgment; cf. Ger. *Urteil*), or *Judicium Dei*, very common medieval method of deciding doubtful questions. It is not an isolated phenomenon, for in all parts of the world such appeals to magic are common, and many close analogies to the medieval methods may be found. It will be possible here to deal with the medieval forms. Trials were generally made by boiling water, by red-hot iron, by cold water, by fire, or by blessed bread (*the corsnaed*). In the trial by boiling water the accused person was made to plunge his hand, and sometimes his arm, into boiling water, and perhaps take something from the bottom of the vessel. The hand was then sealed up, and his guilt or innocence was judged by its condition at the end of 3 days. The O. by red-hot iron was performed either by carrying a red-hot iron a certain number of paces or by walking barefoot over or between red-hot ploughshares. Well-known examples of this type of O. are those which vindicated Queen Emma (mother of Edward the Confessor) and St Kunigunde. In the trial by fire the accused had to justify himself by walking between two fires of wood placed close together. Here, again, a certain number of days was allowed for recovery. In the O. by water the accused was bound and thrown into cold water. If he sank he was innocent, but if the water refused to receive him he was guilty. This long remained a favourite test of witchcraft. The O. by blessed bread depended upon the belief that a perjurer could not swallow such food. Henry III abolished legal O.s in England, except trial by battle, which theoretically remained in force until 1818, when it was brought to an end on the occasion of its claim by a man indicted for murder.

**Ordeal Tree**, see **CERBERA**.

**Order**, in classification (of plants and animals) refers to a related group below class and higher than family. It is therefore composed of a number of families, e.g. the *O. Carnivora* belongs to the class *Mammalia* and includes such families as *Canidae* (dogs) and *Felidae* (tigers and cats). See **CLASSIFICATION**, **PLANTS**; **SPECIES**; **ZOOLOGY**. *O.* is also a term in architecture (q.v.).

**Order in Council**, one of the means by which most of the business of the Privy Council (q.v.) is expressed, authenticated by the signature of the clerk of the council. Proclamations, usually reserved for the more important subjects dealt with by the Privy Council, are signed by the sovereign and pass under the Great Seal. *O.s* in *C.* are sometimes issued to deal with points left outstanding after legislation passed by Parliament has actually come into force; such *O.s* in *C.* are made under many different Acts and may operate throughout almost the whole field of statute law. Committees of the Privy Council, whether standing committees or those convened for a special purpose, when reporting to the sovereign in council must have their recommendations approved by *O. in C.*; in less important cases, however, decisions rest with the committees and are effected without this formality. *O.s* in *C.* are usually complete in themselves and do not generally require further executive acts to bring about their objects.

**Ordericus Vitalis** (1075–c. 1142), Anglo-Norman monk and historian, b. Atcham, Shropshire. St Evroul, a Norman monastery, was his home for most of his life. His *Historia Ecclesiastica* (1123–41), dealing with England and Normandy, contains some important contemporary hist. It was ed. by L. Duchesne in 1619, and by A. le Prévost for the Société Historique de France in 1838–55, and trans. into English by T. Forester in 1853–6.

**Orders, Army.** The queen's regulations and *O.* for the Brit. Army, which were formerly notified in army circulars, have, since 1888, been promulgated together with General *O.* under the title of *A. O.* The Crown has always issued regulations and *O.* for the government and general economy of the military forces, in execution of statutory provisions relative thereto; but such *O.* would not be enforced by the law if in any way *ultra vires*, e.g. if they purported to affect persons not subject to military law (see *as to this* under **MARTIAL LAW**). *A. O.* are issued to the Army Council nominally by the command of the sovereign as expressed under the sign manual. Details relating to appointments and promotions, pay, uniforms, etc., or other special matters, are dealt with by royal warrants issued through the War Office.

**Orders, Holy** (see also **ORDINATION**), the name for the ministry of the Rom. Catholic Church, and for the sacrament by which it is handed on and perpetuated. There are 4 major orders (bishops, priests, deacons, and sub-deacons), and 4 minor (acolytes, exorcists, readers, and doorkeepers). Of the major orders, the first

3 are the *H. O. par excellence*. *H. O.* are conferred sacramentally by the laying-on of hands by a bishop. The bishop conferring them must himself have been validly consecrated by another bishop in the Apostolic succession (q.v.). The Church of England abandoned the minor orders and sub-diaconate (but see **LAY-READER**) at the Reformation, but retained the 3 prin. major orders (which most of the protestant bodies rejected, setting up ministries of their own on what they considered to be the *N.T.* model). Whether the Anglican Church holds the Rom. Catholic view of *H. O.* as the only valid and lawful ministry of Christ's Church, *jure divino*, and so of the *esse* of the Church, may be disputed. She prefers to leave it an open question. Some Anglicans think that *H. O.* are only of the *bene esse* of the Church. Anglican orders were condemned as invalid by the Rom. Catholic Church in 1896 (*Apostolicae Curiae*), on the ground of defect of right intention. Anglicans vigorously and ably rebut this charge. The Presbyterian Church accepted only one order of the ministry, that of presbyters (priests), rejecting the need of a bishop for ordination. See H. B. Swete, *Early History of the Church and the Ministry*, 1918; C. Jenkins and K. Mackenzie, *Episcopacy, ancient and modern*, 1939; K. E. Kirk, *The Apostolic Ministry: Essays on the History and Doctrine of Episcopacy*, 1946.

**Orders, Monastic**, see **MONASTICISM**.

**Orders of Architecture**, see **COLUMN**.

**Orders of Knighthood.** Origin and hist. of knighthood generally has been treated in the article **KNIGHTHOOD**. This article relates principally to the different *O. of K.* of the various nations of Europe.

**GREAT BRITAIN AND IRELAND:** (1) *The Most Noble Order of the Garter*. Selden, corroborated by Froissart, fixed the date of the foundation of this anct order as 1348; but, in the absence of all authentic records, both the date and the cause of foundation rest upon mere tradition. The register known by the name of the Black Book, which is usually referred to as treating of the order from its very foundation, was only drawn up in its present form towards the middle of the 16th cent. According to Froissart Edward III resolved to re-erect Windsor Castle, the scene of dramas of King Arthur and the Round Table, and to make an order of knights of himself and his children, to be called the Knights of the Blue Garter, and that an ann. feast of the order should be solemnised at Windsor on the day of St. George. Popular tradition has the different version, derived from the romantic episode narrated by Polydore Vergil, of the Countess of Salisbury's garter dropped at a court festival and picked up by the king himself, who, observing the general significant smile of the onlookers, tied it round his own knee and uttered the celebrated words: 'Honi soit qui mal y pense.' A third theory is that of Camden, the antiquary, who says that the order originated at the battle of Crécy, when Edward ordered his garter to be displayed as a signal for the onset. In any

case, there is no more ancient or illustrious order in Europe. Its officers consist of the Prelate (bishop of Winchester), the Chancellor (bishop of Oxford), the Registrar (dean of Windsor), Garter King of Arms, and the Usher of the Black Rod. It had undergone many changes before the Act of 1805, when its constitution was fixed as comprising the sovereign and 25 knights companions, together with such lineal descendants of George III as might be elected. Its statutes have at different times provided for the admission of sovereigns and extra knights, the latter of whom have always become part of the 25 companions on the occurrence of



THE STAR OF THE GARTER

vacancies. Since 1947 membership of the order is again at the sole discretion of the sovereign without reference to the Prime Minister. The habit and uniform are the garter of dark blue ribbon, edged with gold, bearing in golden letters the motto above-mentioned, with chased gold pendant and buckle; blue velvet mantle lined with white taffeta; star of the cross of St George; crimson velvet hood and surcoat, black velvet hat with plume of white ostrich feathers and a tuft of black heron's feathers fastened with a band of diamonds; gold collar with 26 pieces, each in the form of a garter, and the figure of St George slaying the dragon attached to it. Each knight has his stall in St George's chapel, Windsor, and his garter-plate (displaying his arms) remains there permanently. Knights of the Garter write K.G. after their names. See also MILITARY KNIGHTS OF WINDSOR.

(2) *The Most Ancient Order of the Thistle.* Founded in 1887, it fell into desuetude after the abdication of James II, but was revived in 1703 by Queen Anne. The insignia are the star worn on the left side of the coat, consisting of a St Andrew's cross of silver embroidery, in the centre of which is a thistle of green in a field of gold, surrounded by a circle of green bearing the motto 'Nemo me impune lacessit' ('No one provokes me with impunity,' the motto of all the Scottish regiments, and generally rendered in

the vernacular, 'Wha daur meddle wi' me!'); the collar of thistles intermingled with sprays of rue; and the badge worn pendant-wise and tied under the arm, consisting of a figure of St Andrew, in gold enamel, with green gown, bearing before him the cross, enamelled white, the whole environed with rays of gold in the form of a glory. By a statute of 1827 the order is to consist of the sovereign and 16 knights.

(3) *The Most Illustrious Order of St Patrick.* The national order of Ireland, founded by George III in 1783. It was formed on the model of the Garter, and named after the Irish patron saint. The motto is 'Quis separabit?' ('Who shall separate?'). The insignia are the star of the cross of St Patrick on a field argent, charged with 3 imperial crowns within a circle of azure, with motto above. The order now consists only of the sovereign and about a dozen knights, including princes of the royal blood.

(4) *The Most Honourable Order of the Bath.* Founded traditionally in 1399 by Henry IV, revived by George I in 1725. It differed from the *Knighthood of the Bath*, that more ancient order, admission to which was characterised by various ceremonies, the chief being that of bathing, and which form seems to have died out at the coronation of Charles II, but to have been revived and combined with the newer order into a regular military order. There were to be originally, in addition to the sovereign and a prince of the royal blood, only 35 knights; but eventually, to commemorate the termination of the Napoleonic wars, the numbers were increased and divided into 3 classes; and again, in 1847, it was further extended by the addition of civil knights commanders and companions. The first class is comprised of knights grand cross (57 military, 29 civil, excluding distinguished foreigners); and the second, knights commanders (161 military, 112 civil, exclusive of foreigners); the third, companions of the order (702 military and 368 civil). The principal insignia of the military classes are a gold Maltese cross with the inscription 'Ich dien,' gold collar of 9 imperial crowns and 8 roses, thistles, and shamrocks issuing from a sceptre; of the civil classes, a silver star of 8 rays, charged with 3 imperial crowns, surrounded by a red circle in which is the same motto; a badge of gold with the same emblematic rose, thistle, and shamrock.

(5) *The Most Distinguished Order of St Michael and St George.* Founded 1818, after the cession of Malta to Britain and the submission of the Ionian Is. to Brit. protection, for the purpose of honouring the most meritorious of the Maltese and Ionians, and also such Brit. subjects as had distinguished themselves in the Ionian Is. or Mediterranean. William IV. ordained that it should consist of knights grand cross, knights commanders, and cavalieri or companions, to the number of 15, 20, and 25 respectively. The members of the order enjoy rank and precedence immediately after the corresponding classes of the Order of the Bath. The

insignia of the knights grand cross are a 7-rayed silver star, in the centre of which is a representation of the Archangel St Michael encountering Satan, and the motto 'Auspicium mellioris aevi' ('Auspice of a better era'); a collar of lions and Maltese crosses, a gold cross badge surmounted by the imperial crown, a Saxon-blue satin mantle lined with scarlet silk, and a blue satin chapeau; of the knights commanders and companions, a 4-rayed star and smaller cross.

(6) *The Most Exalted Order of the Star of India*, instituted in 1861, now comprises knights grand commanders, knights commanders, and companions. The collar of the star consists of links of lotus flowers, red and white roses, and palm branches. The motto is 'Heaven's Light our Guide.'

(7) *The Most Eminent Order of the Indian Empire*, under the grandmastership of the Indian viceroy, was estab. in 1877 to commemorate Queen Victoria's assumption of the title Empress of India. The collar is composed of elephants, peacocks, and Indian roses. The motto is 'Imperatrix auspiciis' ('Under the auspices of the Empress').

(8) *The Royal Victorian Order* was founded by Queen Victoria in 1896 'as a reward for personal services to the queen and her successors.' Motto: 'Victoria.'

(9) *The Most Excellent Order of the British Empire*, instituted in 1917, having both civil and military divs., awarded to both men and women for services rendered to the Brit. Empire. It has 5 classes: Knights or Dames Grand Cross (G.B.E.); Knights or Dames Commanders (K.B.E. or D.B.E.); Commanders (C.B.E.); Officers (O.B.E.); Members (M.B.E.). Motto: 'For God and the Empire.'

(10) *The Knights Bachelor* do not constitute a royal order, but comprise the surviving representation of the anc. State O. of K. The Register of Knights Bachelor, instituted by James I in the 17th cent., lapsed, and in 1908 a voluntary association, now known as 'The Imperial Society of Knights Bachelor' by royal command, was formed with the primary objects of continuing the various registers dating from 1257, and obtaining the uniform registration of every created knight. In 1926 a design for a badge to be worn by Knights Bachelor was approved and adopted.

AUSTRIA. The following orders of imperial Austria have been officially discontinued, although the orders are still worn. (1) *The Order of the Golden Fleece*, founded by Philip le Bon (Duke of Burgundy and the Netherlands) in 1429, on the occasion of his marriage to Isabella of Portugal. Its archives were taken by Charles VI to Vienna, and there received with vast splendour, but the grandmastership of the order was for a long time a bone of contention between Spain and Austria, and was tacitly settled by the estab. of a Sp. and an Austrian branch. The motto is 'Je l'ay empris' ('I have accepted it') (the order). The characteristic emblem of the order is the golden fleece, hanging on a golden blue-enamelled

flint stone, emitting flames of fire, and the motto 'Pretium laborum non vile.'

(2) The purely military *Order of Maria Theresa*, founded by that queen in 1757. (3) *The Order of Leopold* (founded as a set-off to the apostolic *Order of St Stephen*, which was confined to the nobility), estab. in 1808 by Francis I for the purpose of honouring all meritorious subjects, civil or military, regardless of rank. (4) *The Order of Elizabeth Theresa*, founded in 1750; the second military order of Austria. (5) *The Order of the Iron Crown*, founded in 1809 by Napoleon Bonaparte in commemoration of his coronation as the first hereditary king of Italy, the reigning kings of the various It. states to be grand masters of the order. After the fall of Napoleon the order was forgotten until Francis I of Austria, in 1816, during his visits to the new It. provs., reintroduced it in a modified form, when it received the name of the *Austrian Order of the Iron Crown*. The name is derived from the anc. Lombard crown (which was used to crown Napoleon) of gold and precious stones, behind which is attached an iron ring forged, according to tradition, from the nails of Christ's cross. Other orders of Austria were the *Order of the Star Cross* and the *Teutonic Order* (which originated like the Hospitallers of St John in the time of the crusades), and the *Civil Cross of Merit*, founded in 1850.

BELGIUM: (1) *Order of Leopold* (civil and military), founded in 1832. Motto: 'Union is strength.' The administration of the order is vested in the foreign minister. The characteristic emblem is the crossed swords and crowned lion. (2) *Iron Cross and Medal*, founded 1835. Like the Order of Leopold, conferred upon the revolutionary defenders of the fatherland; hence the inscription 'Indépendance de la Belgique.'

BULGARIA: *The Order of St Alexander* was instituted in 1881, and the senior *Order of SS. Cyril and Methodius* in 1909; both were abolished by decree in 1948. In the same year the following orders were created or maintained: *People's Republic of Bulgaria*; *People's Liberty 1941-1944*; *9th September 1944*; *For Bravery* (military); *People's Order of Labour*; *For People's Service*; and *For Science and Arts*.

DENMARK: (1) *The Order of the Elephant*. Officially dated as of the first half of the 15th cent., is rarely bestowed and commands high respect. Originally of a religious character, and formerly requiring papal consent on grant, since 1693 it has entirely lost its religious element. Distinctive emblem, a white elephant and mahout. Motto: 'Magnanimit Pretium.' (2) *Order of the Dannebrog*. Second of the Dan. O. of K., founded by Waldemar II, 1219, in honour of the banner of Denmark, which was supposed to have fallen from heaven to inspire the army at the siege of Reval. In 1500 the order was suppressed, but revived by Christian V in 1671. In 1808 Frederick VI made it an order of merit for all the Dan. people, whether for military or civil services. It has 4 degrees, and in addition a class of Dannebrogsmænd, who are not strictly members

of the order. In 1842 a special class (grand commanders) was created for persons of royal blood. The decoration is a white enamelled gold cross, suspended by a white ribbon with a red border. The inscription reads 'God and the King,' and it carries the figures 1219, 1871, and 1808.

FRANCE: *The Legion of Honour* (the only existing order in France). After the coronation of Napoleon (1804) this order, which was estab. in 1802, as early as the year 1814 counted about 37,000 members. Its organisation has been modified at various times, and the order is now divided into 5 ranks, viz. knights of the grand cross, grand officers, commanders, officers, and knights. There is no more numerous order of knighthood at present in existence anywhere. The highest grades, however, rank with the most exalted European orders, and the celebrated cross is a much coveted distinction. The president of the Fr. Rep. is the grand master of the order, but the administration is vested in a grand chancellor. Military and naval members receive salaries when on the active list. Women are eligible, e.g. Rosa Bonheur and Madame Curie were both members. There is a considerable number of foreign members, whilst the number of Fr. members of the 4 higher classes is limited. The decoration consists of a white enamelled star with double rays under a royal crown, in the centre of which is the effigy of Henry IV, and on the reverse the motto 'Honneur et Patrie.' The star for the knights is silver, and for the other classes gold.

GERMANY: The following are the orders which were in existence under the old Ger. Empire: *The Order of Albert the Bear* (Anhalt); the orders of *Fidelity*, of *Charles Frederick*, of the *Zähringen Lion*, and of *Berthold I* (Baden); *The Order of St Hubert* and the military *Order of Maximilian Joseph* (Bavaria); *The Order of Henry the Lion* (Brunswick); the orders of *Louis*, of the *Golden Lion*, and of *Philip the Magnanimous* (Hesse); the orders of the *Wendish Crown*, and of the *Griffin* (Mecklenburg-Schwerin); *The Order of Duke Peter Frederick Louis* (Oldenburg); orders of *The Black Eagle*, of *The Red Eagle*, *Order for Merit*, orders of *The Crown*, of *William*, of *The House of Hohenzollern*, and for ladies of *Service* (Prussia); *Order of the Rauten Krone*, or *Crown of Rue*, the military *Order of St Henry*, and *The Order of Albert* (Saxony); *The Order of Ernest* (duchies of Saxe-Coburg-Gotha and Saxe-Meiningen); *Order of Vigilance* (Saxe-Weimar); orders of *The Crown of Württemberg*, of *Frederick*, and of *Olga* (Württemberg); *Iron Cross*, originally instituted in 1813 by Frederick William III for service in the war of Liberation, and granted to civil as well as military personnel. The decoration consists of a Maltese cross of iron edged with silver, and, formerly the initial of the sovereign granting the award was in the centre; above, on the upper arm, is a crown, and below, on the lower arm, the date of the campaign. The Grand Cross of double the size is presented to the victor of a

decisive battle. The cross is worn round the neck. The two remaining classes, called first and second, granted for bravery in action, are worn on the left breast. The order was revived by William I on 19 July 1870, just before the outbreak of the Franco-Prussian war, and again in the First and Second World Wars, when large numbers were awarded.

The Prussian orders of *The Black Eagle* and *For Merit* were among the most distinguished in the world. The former was founded by the elector of Brandenburg on the day of his accession to the throne of Prussia in 1701. The emblem was a blue enamelled octagon, consisting of a cross with 'F.R.' (Fredericus Rex) in the middle of the obverse, and a black eagle with expanded wings in each of the 4 spaces between the arms of the cross. Candidates must already have been knights of the Red Eagle. *The Order for Merit*, called *Pour le Mérite* in Germany, was divided into 2 classes: military, and science and art. It was originally founded as the 'Ordre de la Générosité' by Prince Charles Emil in 1665, but in 1740 converted by Frederick II to its later appellation and restricted to military persons. A century later it was extended to persons of civil merit, when, among others, the following celebrated Germans were honoured in the new div.: Savigny, Lessing, Mendelssohn, Schelling, Schlegel, Tieck, Meyerbeer, Grimm, Humboldt, and Schwanthaler; and the following foreigners: Count Borghese, Chateaubriand, Faraday, Herschel, Daguerre, F. Liszt, and Rossini. Later recipients include Carlyle and von Moltke.

GREECE: *The Order of the Redeemer*, founded in 1833 by King Otho to commemorate the deliverance of Greece after the war of Independence. Badge: white enamelled cross, the wings of which are connected with oaken and laurel leaves. *The Order of George I* was instituted in 1912.

HOLLAND: (1) *The Military Order of William*, founded in 1815. Emblem: a cross with the motto 'For valour, devotion, loyalty.' (2) *The Order of Orange Nassau*, founded by Queen Wilhelmina in 1892. (3) *The Order of the Netherlands Lion*, founded (1818) for civil merit.

ITALY: Titles of nobility are no longer recognised, but the following orders existed before 1946: (1) *The Order of the Annunziata*, founded in 1362 by Amadeus VI, Count of Savoy, under the style of *The Order of the Collar*. It was the highest order in Italy, and its members took precedence over all other state officials. Emblem: a collar consisting of love-knots and roses, with a pendant and medallion representing the Annunciation. (2) *The order of SS. Maurizio e Lazzaro* (St Maurice and St Lazarus), being a combination of the ant. *Military Order of St Maurice*, founded in 1434, and the religious *Order of St Lazarus*, founded in 1573. Its great merit lay in the fact that not only was it pre-eminently conferred on persons notable for their charitable works, but that its income was devoted to charitable purposes. (3) *The Order of the Crown of*

*Italy*, founded in 1868 to commemorate the estab. of the kingdom of Italy.

**LUXEMBOURG:** *The Order of Adolphus of Nassau* (1858); *The Order of the Oak Crown* (1858, revived); and *The Order of the Golden Lion* (1890), which is the hereditary order of the grand duke.

**MONACO:** *The Order of St Charles* (1853, revived).

**NORWAY:** (1) *The Order of St Olaf*, founded in honour of the introducer of Christianity into Norway. (2) *The Order of the Norwegian Lion*, founded by Oscar II in 1904.

**POLAND:** *The Order of the White Eagle* and *The Order of Pelonia Restituta*.

**PORTUGAL:** The orders of *Christ*, *St James*, and *Aviz*, all 3 being originally spiritual orders, but secularised in 1789. The first-named was a revival of the Templars after their abolition in France by Philip le Bel, King Diniz of Portugal giving an asylum to that famous order in consideration of their support against the Sp. Moors in Algarve. The distinctive emblem is a white cross within a red.

**RUMANIA:** *The Order of the Star of Rumania* (1877) and *The Order of the Crown of Rumania* (1881). The latter has both civil and military divs. Both were abolished in 1947.

**RUSSIA:** Under the Soviet Gov. there are no titles. In former imperial Russia the tsar used to be Grand Master of all the Russian orders, with the exception of that of *St Catherine*, which was an order for ladies. The grand dukes became, at baptism, knights of the order of *St Andrew*, founded in 1698 by Peter the Great to initiate his court into the refinement of the civilised courts of Europe and to encourage his nobility in the pending war with Turkey; *Alexander Nevsky*, founded in 1725 by Catherine I; *The White Eagle*, founded in 1713 by Augustus II of Poland, and after the revolution of 1831 united, together with other Polish orders, with those of Russia; and *St Anne*, founded in 1735 by Duke Charles Frederick in memory of the Empress Anne and in honour of the Duchess Anna Petrovna. The prin. emblems of the above orders were: for that of *St Andrew*, a blue enamelled figure of St Andrew on the cross, resting on the eagle of the empire with 3 crowns; of *Alexander Nevsky*, an octagonal red enamelled cross with the imperial eagle in its corners, and in the middle the figure of St Alexander on horseback; of *The White Eagle*, a cross containing on its face the white eagle with expanded wings, and gold flames in the corners; of *St Anne*, a Maltese cross with the initials of St Anne and the inscription 'Amant: just: piet: fidem.' The decoration of the order of *St Catherine* was, for Class I, a grand cross adorned with diamonds, the figure of St Catherine, and the inscription 'For love and fatherland'; for Class II, a similar star, smaller in size and with fewer diamonds. *The Military Order of St George* was founded in 1769 for military service on land or sea, and the decoration was a white cross with gold borders, containing in its central medallion the figure of St George slaying

the dragon. But while there are no longer titles or O. of K. as such, there are many related to war services or labour. The highest Soviet distinctions are those of *Hero of the Soviet Union* and *Hero of Socialist Labour* and both include the *Order of Lenin* (instituted in 1930), the *Hammer and Sickle Gold Medal*, and a certificate of honour. Other orders, instituted between 1918 and 1935, are those of the *Red Banner* (1918), the *Red Banner of Labour* (1920), the *Red Star* (1930), and the *Badge of Honour* (1935). Six more orders, issued during the Second World War, are of the *Patriotic War*, *Suvorov*, *Kutuzov*, *Alexander Nevsky*, *Bogdan Khmelnitsky*, and *Victory and Glory*.

**SPAIN:** All orders were abolished after the declaration of a rep. The chief orders which existed under the monarchy were those of (1) *St James of Compostella* (patron saint of Spain after the victory of Clavijo), founded by certain nobles in the 12th cent. by analogy to the Templars in pursuance of their united intention to protect Christian pilgrims against the Moors. It degenerated into a mere decoration of military merit. The badge is a representation of the cross of red cloth shaped like a sword, with red carved lilies on the hilt, which used to be worn by the old knights. (2) *St James of Calatrava*, founded with a view to protect Castile against the Moors. The representative cross of this order was a red cross cut out in the form of lilies. (3) *St James of Alcantara*, formed to protect Spain against the Moorish inroads when the above orders had been compelled to migrate by Ferdinand, King of León and Galicia. The cross in this case, which was substituted for the previous black collar and scapulary, is green. *The Order of the Golden Fleece* has been dealt with under Austrian orders, there having been both a Sp. and an Austrian branch of that order.

**SWEDEN:** *The Order of the Seraphim*, or *The Blue Ribbon*, founded according to general opinion in 1280 by Magnus I, is the most ancient and illustrious existing Swedish order. Its objects, which were very exalted, consisted in carrying out the candidate's promise made to God and the king to defend the laws of the order, to shed his blood for the evangelical religion and his country, and to sustain the ancient glory of the Swedish name. The badge is a star with the initials J. h. s. (Jesus hominum salvator). Other orders are those of the *Pole Star*, *Charles XIII* (granted to freemasons of high degree), *Vasa* or *Green Ribbon*, and the *Sword* or *Yellow Ribbon*.

**TURKEY:** *The Order of Glory* (1831) and *The Order of Privilege* (1879). Also 2 other orders with civil and military awards, the *Medjidie* (1852) and the *Osmanieh* (1862). Titles were abolished in 1934.

**YUGOSLAVIA:** The following are the old Serbian and other orders, the traditions of which were continued under the kingdom of Yugoslavia: *The Order of the White Eagle* (1882); *The Order of St Sava* (1883); *The Order of Milosh the Great* (1898); *The Order of the Star of Karageorgevit* (1904).

*The Order of St Lazarus* belongs only to the king. They were abolished after the declaration of a rep.

Other and non-European countries also have or had O. of K. Japan's prin. order is that of the *Chrysanthemum*, founded in 1877, and practically conferred only on members of the royal house or foreign princes. The only Chinese order was that of the imperial *Double Dragon*, which was conferred only on foreigners, the Chinese native analogy to a knight being the *man darin* (q.v.). Siam has *The Order of the White Elephant* (1861), also the *Sacred Order* for royalty; Persia, *The Order of the Sun and Lion* (1808). Egypt had sev orders of recent creation: *Order of Mohammed Ali* (1915); *Order of the Nile* (1915); *Order of Al Kamal* for ladies (1915) the *Military Star of King Fuad* (1919) and the *Order of Ismail* (1922). See also HOSPITALIERS, KNIGHTS, and NOBILITY.

See J. B. Burke, *The Book of Orders of Knighthood and Decorations of Honour*, 1858, and the *Almanach de Gotha* (to 1944).

Ordinaries, see HERALDRY.

Ordinary, in canon law, an ecclesiastic of superior standing, who exercises his jurisdiction according to the normal discipline of the Church. In the Anglican Church it usually means the bishop or his chancellor.

Ordinate, see GEOMETRY, *Analytical Geometry*.

Ordination, sacrament by which holy orders are conferred in the Christian Church (cf. Acts i). Early forms are to be found in the Prayer-book of Serapion, Justin Martyr, the *Didache*, and the *Canons of Hippolytus*. In the Rom. Catholic, Orthodox, and Anglican Churches O. can be conferred only by a bishop. Among Presbyterians, O. is performed by the body of presbyters, acting by one of their number previously appointed. Here also the imposition of hands is used. The act by which a bishop is made is called Consecration.

Ordinance, heavy weapons of warfare, see ARTILLERY.

Ordinance, Board of. From Coke's reports we learn that the B. of O. took its name from an ordinance or law (not extant) made to regulate the bore and size of artillery, and was the state dept charged with the care of crown fortresses and their armaments, garrisons, and stores. The board dates back to the Middle Ages, but it was not till 1683 that it was reorganised as a civil dept of the state for the custody and supply of both naval and ordinance stores, and the master-general of the board placed under the orders of both the Lord Treasurer and the Lord High Admiral. The navy was formerly more associated with the ordinance than the army, but the development of the standing army has resulted in the army subsequently acquiring possession of the Ordinance Dept, and, through the secretary for war, providing all armaments and warlike stores, munitions, and equipment for both services. After the revolution of 1688 the B. of O. was divided into 2 branches: the 'military,' under the master-general, and the

'civil,' which had to do with making contracts with manufacturers or contractors to supply warlike munitions and equipment, and acted as custodian of the store dept. The master-general, who was independent of the secretary for war, was president of the B. of O., and the chief adviser to the Crown in military matters. This position he held throughout the 18th cent., and down to 1828 he was generally a member of the Cabinet. The board presented its own estimates to Parliament, and was therefore separately responsible to Parliament for the expenditure of the money voted to its use. Down to its abolition it appears to have done an immense amount of work, though there seems not unnaturally to have been an inveterate antagonism between the Ordinance Dept and the secretary for war, especially as, in spite of the distinction into a civil and a military branch, the former had soon become more or less merged in the latter. The duties of the board were in the highest degree comprehensive, comprising as they did the construction and upkeep of forts, the acquisition of land for that purpose, the purchasing, warehousing, and forwarding of stores, the manuf. of munitions and equipment for army and navy, the organisation and administration of the Royal Artillery and the Royal Engineers and associated corps, and the execution of the ordinance survey and geological survey (qq.v.). It seems clear that all these duties, being essentially ancillary to those of the War Dept, could hardly be economically and efficiently carried out except by that dept, and it is not surprising that they were, in 1855, transferred to the War Dept by the Ordinance Board Transfer Act, from which year the B. of O. ceased to exist.

Ordinance Factory, Royal, Brit. Gov. organisation for the production of war materials. They come under the control of the Ministry of Supply. There was great expansion of the O. F.s during the war years, some being both built and worked by the gov., others built by the gov. and worked by private firms under contract. See I. Hay, *R.O.F.: the Story of the Royal Ordnance Factories*, 1949.

Ordinance Survey. The O. S. was estab. in 1791 to carry out a trigonometrical survey of England and Wales and also to make a map of Great Britain at the scale of 1 in. to 1 m., chiefly for defence purposes. The task being a military one, it was entrusted to the Board of Ordnance (q.v.), whence the title O. S.

By 1840 only Scotland and the 6 N. Eng. cos. remained unmapped at the 1-in. scale, and in that year the Treasury, after survey experience in Ireland, decided that these areas should be surveyed at the 6 in. to 1 m. scale. A long controversy ensued as to the most suitable scale. A departmental committee in 1853 recommended the survey of all cultivated areas at a scale of 1 : 2500, a scheme approved by the Treasury, but limited to areas where the 6-in. survey was being carried out. An adverse vote by the House of Commons in 1857 aroused such criticism

that a royal commission on the subject was estab., which in 1858 approved the 1:2500 scale. Four years later the House of Commons ordered the extension of a survey at this scale to the S. cos., still mapped only at the 1-in. scale. To meet an agitation for the cheapening of the system of land transfer the estab. of the O. S. was doubled in 1880, and from 1890 a complete series of the large-scale plans was available.

The civil work of the O. S. had long preponderated over the military, so that in 1870 control passed from the War Office to the Ministry of Works, passing to the Board of Agriculture later and remaining under the control of the equivalent ministry.

The First World War interrupted severely the periodical revision of the large-scale survey, and afterwards financial retrenchment put heavy limitations on the dept's work. Thus the inter-war development of new housing estates and roads outstripped the recording of them by the O. S. Administrative efficiency became so impaired that, in 1935, a departmental committee, under Viscount Davidson, was estab. to report on the matter. The Second World War almost immediately interrupted the implementation of the committee's recommendations, and not until 1947 was real progress possible. Since then the new Primary Triangulation of Great Britain has been completed, in 1952, and the re-survey of the main urban areas at 1:1250 scale, and the revision and re-casting into National Grid sheet lines of the 1:2500 plans, are well in hand. See also MAPS.

**Ordovician System**, geological name of the second system of Palaeozoic rocks (q.v.); the Ordovician follows the Cambrian, and is followed in turn by the Silurian. The Ordovician in Wales, where it was first recognised and named after the ant tribe of Ordovicii, consists of greywackes, grits, and shales, with black mudstones, conglomerates, and limestones, and is arranged into 4 chronological groups: Arenig, Llanvirn, Llandello, and Bala. The last is the youngest. Three different types or facies of Ordovician deposits can be seen in Britain. The first consists of sandy or limey beds often with an abundant fossil fauna in which brachiopods and trilobites are conspicuous. Such beds were laid down in shallow seas. A second type consists of thin bands of graptolite-bearing shales alternating with cherts containing trilobites. Graptolites were floating animals living far out to sea whose remains are found in deep water sediments. This type of deposit is accordingly regarded as a deep sea deposit. The third type of O. S. known in Britain consists of volcanic rocks. Both the Arenig and Bala subdiv. record periods of volcanic activity. Volcanic rocks of Bala age build up the ranges of Snowdon and Penmaenmawr.

In the Lake Dist. the Borrowdale volcanic Series is underlain by the Skiddaw Slates with Arenig graptolites and overlain by the Conistone Limestone which contains Bala brachiopods. The Ordo-

vician of Scotland, exposed in the S. Uplands (Girvan, Moffat), indicates deep-water conditions at Moffat, where graptolites occur in a thin succession of shales, which contrast with the thick succession, seen between Girvan and Ballantrae, famous for radiolarian cherts, pillow lavas, and serpentines. Ordovician rocks are known from many other parts of the world, and can be subdivided and correlated by their faunas, the graptolites being especially useful in the shaly facies. Trilobites, cephalopods, brachiopods, and radiolaria were abundant and very early fishes have been found in the Rockies in W. America.

Ordu, il of Turkey on the N. coast of Asiatic Turkey, between Samsun and Kerasund. Pop. 409,891.

**Ordzhonikidze**, Grigoriy Konstantinovich (1886-1937), Georgian Communist. He joined the Bolsheviks in 1903; in 1912 he became a member of their Central Committee. O. spent sev. years in prison and banishment. After the Oct. revolution (q.v.) in 1917 he was Extraordinary Commissar of the Soviet Gov. in S. Russia. In 1920 he became the head of the party in the Caucasus, in 1921 in Transcaucasia, and in 1926 chairman of the Central Control Commission of the party, whose task was to suppress oppositionists (see COMMUNIST PARTY OF THE SOVIET UNION), and deputy head of the gov. He became chairman of the Supreme Council of National Economy, and a Politburo (q.v.) member, in 1930, and in 1932 commissar for heavy industry. O. was one of Stalin's chief lieutenants, but during the Great Purge (q.v.) he d. in mysterious circumstances, according to Khrushchëv, having been driven to suicide by Stalin.

**Ordzhonikidze: 1.** (until 1939 Vladikavkaz; 1944-54 Dzauzhikau). Tn in N. Caucasus, on the Terek cap. and economic centre of the Ossetian Autonomous Rep. (q.v.). It has lead and zinc works and food industries, and is the main cultural centre of the N. Caucasus. It was founded in 1783 as a Russian fortress, and in 1863 became cap. of Terek oblast. In 1921-4 it was cap. of the Mt People's Autonomous Rep. (q.v.). Pop. (1956) 159,000 (1859, 2500; 1897, 44,000; 1939, 127,000), mainly Russian.

2. See YENAKIYEVO.

**Ordzhonikidzegrad**, see BEZHITSKA.

**Ore and Ore Dressing.** An ore generally consists of metal-bearing minerals, together with earthy material or 'gangue.' Before the metals can be extracted from the minerals as much as possible of the earthy material must be removed from the ore, the process being known as ore dressing. In general only the precious metals such as gold, platinum, etc., are found 'native,' that is in the elemental state. Base metals, owing to their higher chemical reactivity, are more often found in chemical combination with non-metallic material such as oxides, sulphides, sulphates, carbonates, phosphates, silicates, etc. It is common to find the minerals of 2 or more metals deposited together, e.g. the nickeliferous magnetite pyrites of Canada, which consist of nickel,



copper, and iron sulphides associated together. Other minerals may consist of the double compound of 2 metals, e.g. dolomite, a calcium-magnesium carbonate. It is only when the cost of extraction, considered in conjunction with marketing costs (e.g. transport over long distances when the metal is found in remote regions), is economic relative to the selling price (a factor governed by supply and demand) that the deposit is reckoned as an ore. It is commercially practicable to mine and treat material containing very small percentages of the precious metals, e.g. gold ores may contain as little as 0.2 oz. per ton, while on the other hand it does not pay in most countries to deal with iron deposits containing less than about 20 per cent of iron. In ore dressing rock ores are first broken down in jaw-, gyratory-, or roll-crushers, or in stamp mills, then in some cases finely ground in ball mills. Classification, or sizing of particles, is carried out during fine grinding. Most classifiers operate on the principle of Stokes's law, in which a rising column of water in a tank containing the ore carries away the fine material while leaving the coarse in the tank. 'Concentration' follows: magnetic material can be separated from non-magnetic in the magnetic separator. Jigs and concentrating tables and the old gold-miner's pan all depend upon separation of the less dense 'tailings' and denser 'concentrates' into 2 layers, a process known as stratification, when the ore is treated with a stream of water. 'Froth flotation' is able to concentrate extremely fine material and is particularly applicable to sulphide ores. In this method frothing and collecting agents are added to the fine material in a tank and air bubbled through it from the bottom. The mineral adheres to the bubbles and is carried to the surface, where it is scraped off into separate containers. After concentration the mineral must be filtered and dried ready for the extraction processes. See METALLURGY.

**Örebro, or Orebro:** 1. Prov. of central Sweden. Area 3560 sq. m.; pop. 257,136.

2. Cap. of above prov., near the W. end of Lake Hjelmar, 53 m. SW. of Vesterås. It was long a place of assembly of the diet, which, in 1520, here decreed the estab. of Lutheranism. It was largely rebuilt after a fire in 1854, and is now a centre of the iron trade; copper and silver are also mined near by. Manufs. include machinery, chemicals, footwear, and matches, and the chief state railway workshop is here. O. is an inland port and a railway junction. There is a state technical college. Pop. 70,412.

**Oregon,** the 'Beaver State,' one of the United States of America, bounded on the N. by Washington, E. by Idaho (from which states it is separated by the Columbia R. and the Snake R. respectively), S. by California and Nevada, and W. by the Pacific Ocean. Total area 96,980 sq. m., including 630 sq. m. of water. The prin. rvs. are the Columbia and its branches, i.e. the Willamette, Fall R., Snake R., and the Owyhee.

The Columbia, which is 14 m. wide at its mouth, carries abundant steamship traffic 400 m. from the Pacific to the Idaho state line. The Dalles and Cello Canal, completed in 1915, opens the Columbia and Snake R.s. to navigation to a distance of nearly 600 m. from the ocean. Large ocean-going vessels can reach Portland, 108 m. inland. The Cascade Mts. which have extinct volcanic peaks of 4000 to 14,000 ft high, run N. and S., dividing the state into 2 unequal regions. The W. third of the state, bordering the Pacific, has a mild, equable, and moist climate, with valleys of great fertility, where pines grow from 250 to 300 ft high, and firs from 4 to 10 ft in diameter. Agriculture is the main occupation, and O. has 20,000,000 ac. of farm land. Almost every variety of temperate-zone crop is produced. The prin. industries are lumbering, flour and grist milling, fish canning, paper and pulp making, printing and publishing. There are planing mills, meat-packing factories, foundries, copper-smelting works, and refineries. Minerals include gold, copper, lead, and mercury. Value of mineral products in 1950 was over \$21,000,000. The timber of O. is the most extensive in the U.S.A., with about 29,755,000 ac. of forest land; the ann. cut of timber is the greatest in the country. The fruit industry is an enormous one, O. apples being sold all over the world. Salmon fisheries, especially at the mouth of the Columbia R., are among the world's finest. Halibut, sturgeon, pilchard, tuna, and oyster fisheries are also abundant. Bonneville Dam and defence needs led to the development of ship-building, electrochemical, and metallurgical industries.

O. sends to Congress 2 senators and 4 representatives. The Legislative Assembly has a Senate of 30 members, elected for 4 years, and a House of 60 representatives, elected for 2 years. School attendance is compulsory from 5 to 16 years of age; those between 16 and 18 must attend part-time or evening schools if deficient in basic education. Centres for higher education include the Univ. of O., O. State College, Univ. of Portland, Willamette Univ. Prin. tns: Portland (373,628); Salem, the state cap. (43,140); Eugene (35,880); Klamath Falls (15,875); Medford (17,300); and Astoria, (12,330). O. was the name formerly given to the whole ter. W. of the Rocky Mts, claimed by the U.S.A. as far as lat. 54° 40' N. This claim was resisted by the Brit. Gov., which asserted a right to the entire ter. The boundary dispute was, however, settled on the 49th parallel. The N. portion is now Washington. The territorial gov. was organised in 1848, and in 1859 O. was admitted as a state. Pop. 1,521,341. O. instituted the national movement for direct primaries, initiative, referendum, and recall. It voted for prohibition before the U.S.A. It has a celebrated agric. college at Corvallis with 8000 students. See lists. of the state by N. H. Bancroft, 1886-8; H. S. Lyman, 1903; C. H. Carey, 1922; H. W. Scott, 1924; also J. H. Horner, *Oregon: Her*

with a full or heavy registration. Two years later Elliot and Hill introduced the radiating pedal-board into the York Minster O.; this idea was later combined with Willis's concave and radiating pedal-board.

The ordinary modern O. embodies these principles. It consists of bellows, wind-trunk, and chests and keys and pedals; the keys and pedals are in contact by means of a system of trackers or of electric cables with the pipes and reeds, which are grouped at discretion by means of stops, composition-pedals, and couplers. The electric-contact ideas were first brought forward by Dr Gauntlett at the 1851 Crystal Palace Exhibition. At the Paris Exhibition in 1887 the tubular pneumatic system was advanced. All modern touch systems are variants in these 2 methods. The keys are arranged in 3, 4, or 5 rows, or manuals, the chief manuals being 'great,' 'swell,' and 'choir' as the normal basis, with perhaps 'solo' and 'echo' added. In a 3-manual O. the 'solo' is occasionally found instead of the 'choir.' The principle of the swell was invented by Jordan in 1712; the pipes are ranged in a box, of which the front resembles a Venetian blind, which opens or closes as the swell-pedal is manipulated. The Hope-Jones electro-pneumatic O.s have a double touch, i.e. 2 levels of depression for the same key, the lower being more emphatic and suitable for picking out a theme, the higher being adapted to accompaniment. Similar effects are obtainable by means of ingenious inventions by Casson and others. The compass of keys on a modern O. is 5 octaves (61 notes), and of pedals, 32 notes; and many improvements and new ideas in the matter of swell- and composition-pedals and combination couplers continue to be presented. With the advance in the mechanical perfection of the instrument has come a corresponding advance in ease of control which has made possible the construction of gigantic instruments of which the most notable example is that in the Convention Hall, Atlantic City, U.S.A. This instrument possesses 7 manuals, 1249 stop keys, and over 33,000 pipes, whilst its blowing apparatus necessitates engines of over 400 h.p. Its tonal range is remarkable and is spread over 4 gallery O.s in addition to its main divs. While nothing approaching the size of this monster is found in Britain, there are many magnificent examples of the O.-builder's art in cathedrals, churches, and concert halls. Notable examples are those at Liverpool Cathedral, St Paul's, and Canterbury Cathedral. Size alone is not a criterion, many notable O.s with a smaller tonal range depending chiefly on the refinement and balance of their tone colours rather than on great power. The cinema O. has contributed something new both in tonal values and constructional technique. Making free use of the extension principle whereby various tones are 'borrowed' at varying pitches, its main tone is based on the tibia, a large-scale flute, instead of the diapason. String, brass, and wood-wind stops give an

orchestral effect and ingenious mechanical devices make possible a variety of percussion effects. A tremulant is generally used over the whole tonal range to overcome the dead acoustics of the average cinema. Instruments vary in size from small instruments with only 5 main ranks to large concert O.s of 3 or 4 manuals capable of reproducing the full range of orchestral tone colour.

In 1935 a new type of instrument made its appearance—the electrophonic O. Instead of pipes, this new development made use of the thermionic valve. The depression of a key caused a valve to oscillate at a fixed frequency corresponding to the note. The electrical wave so produced was fed into an amplifying unit similar to that of a radio set and thence into loudspeakers whence it emerged as sound. Various modulations of tone colour were brought about by the addition of the necessary harmonics to the fundamental tone. Since that date there have been many developments both in the system whereby the initial tone is produced and in tonal variety. The chief advantage of the electrophonic O. is that it does not require tuning, having no pipes; it takes up a minimum space and is considerably cheaper than the pipe O. Nevertheless it is still only in the development stage.

Burn's *Dictionary of Organs and Organists*, 1921, lists over 700 books in the bibliography of the instrument, many of which are now only to be found in technical reference libraries. The standard work on the subject is E. J. Hopkins *The Organ: its History and Construction* 1877. See also C. Clutton and C. Dixon, *The Organ: its Tonal Structure and Registration*, 1950; W. L. Sumner, *The Organ: its Evolution, Principles of Construction, and Use*, 1952; *The Organ* (quarterly magazine).

**Organ, Organic, Organism**, see BIOLOGY and MORPHOLOGY.

**Organic Chemistry**, term formerly applied to the study of compounds obtained directly or indirectly from living organisms or their products or remains, but now used to denote the chem. of the compounds of carbon. The name was first definitely employed in the modern sense of Gmelin in 1848. Organic compounds are extraordinarily numerous, and include such important and diverse substances as hydrocyanic acid, strychnine, brucine, and oxalic acid among poisons; aspirin, antifebrin, salvarsan, chloral, Bayer 205, morphia, penicillin, mepacrin, and diamamine among drugs; chloroform, ether, cocaine and novocaine among anaesthetics; lyddite, trinitrotoluene (T.N.T.), dynamite, nitroglycerine, cordite, and gun-cotton among explosives; camphor, vanillin, musk, geraniol, citral, ionone, and benzaldehyde among perfumes; coal, petrol, paraffin, coal-gas, and most other fuels; starch, sugar, fats, vegetable and animal oils, proteins, and vitamins among foodstuffs; phenol, cresol, iodoform, and formalin among antiseptics; and cotton, silver, alcohol, vinegar, turpentine, soap, dyes, paper,

calcium carbide, and photographic developers among common commodities. Protoplasm itself, the actual living matter of animals and plants is a congeries of carbon compounds.

*Historical.* Although many organic compounds, such as starch and sugar, have been known from very early times, little progress was made in the elucidation of their properties and composition until the late 18th cent., when the Swedish-Pomeranian chemist, C. W. Scheele (1742-86), first prepared, and examined the properties of, chemically pure specimens of many important carbon compounds, e.g. glycerine, uric acid, milk-sugar, and hydrocyanic acid. A. L.

numbers of the same atoms, followed by the further discovery (F. Wöhler, 1828) of the same peculiar relationship between urea and ammonium cyanate, led to the recognition of the phenomenon of isomerism (q.v.). To define the constitution of an organic compound it is, in fact, insufficient to state merely the numbers of the atoms of the various elements in its molecule, since many different compounds of the same molecular formula (isomers) may exist. Thus the formula  $C_2H_6O$  applies to 2 compounds, viz. alcohol and dimethyl ether, while the formula  $C_{10}H_{16}O$  applies to at least 120 different compounds. The frequency with which isomerism occurs emphasised the need to



I.C.I.

A GENERAL VIEW OF A MODERN ORGANIC RESEARCH LABORATORY

Lavoisier (1743-94) began the systematic analysis of organic compounds and showed that, in addition to carbon, the elements most frequently present in them are hydrogen and oxygen, and, less often, nitrogen, chlorine, sulphur, phosphorus, and other elements. Further advances in methods of analysis were made by J. von Liebig (1803-73), and with the simultaneous progress in general chemical theory it became at length possible to arrive at definite conclusions as to the structure of numerous carbon compounds.

In the early days of the science it was believed that organic compounds could be originally formed only under the influence of an occult *vis vitalis* or vital force, but this belief was gradually abandoned when such typical products of living organisms as alcohol, urea, and oxalic acid were prepared artificially in the laboratory. A striking discovery, made by Liebig in 1823, that the molecules of silver cyanate and silver fulminate consist of the same

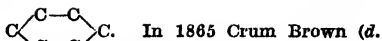
investigate the constitution of carbon compounds much more closely, with the aim of discovering the way in which the atoms are arranged within the molecule. The results of such investigation are expressed in structural formulae, whereby the difference between isomers is clearly indicated. Thus dimethyl ether exhibits properties best indicated by the formula  $CH_3 \cdot O \cdot CH_3$ , whereas the properties of alcohol are represented by the formula  $CH_3 \cdot CH_2 \cdot OH$ . Both formulae, it will be observed, contain the same number of the same atoms viz. 2 of carbon, 6 of hydrogen, and 1 of oxygen, but the structure of 1 molecule is entirely different from that of the other.

Prominent in this research into the molecular architecture of organic compounds were Liebig and Wöhler, who showed that certain groups of atoms, radicals, could maintain their identity throughout a series of chemical changes, and were present in numerous related

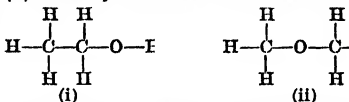
compounds. Thus the radical benzoyl,  $C_6H_5\cdot CO\cdot$ , whilst incapable of independent existence for a long time, is contained in the following (and many other) substances: benzoic acid,  $C_6H_5\cdot CO\cdot OH$ ; benzoyl chloride,  $C_6H_5\cdot CO\cdot Cl$ ; benzoyl iodide,  $C_6H_5\cdot CO\cdot I$ ; benzoyl cyanide,  $C_6H_5\cdot CO\cdot CN$ ; benzamide,  $C_6H_5\cdot CO\cdot NH_2$ ; and benzaldehyde,  $C_6H_5\cdot CHO$ . While the number of radicals is theoretically infinite, it is found in practice that only a comparatively small number occurs with any marked frequency, and by a study of the properties that these common radicals (e.g. methyl,  $CH_3\cdot$ ; ethyl,  $C_2H_5\cdot$ ; carboxyl,  $\cdot COOH$ ; carbonyl,  $\cdot CO$ ; aldehyde,  $\cdot CHO$ ; phenyl,  $C_6H_5\cdot$ ) confer on compounds containing them, it is possible to deduce their presence or absence in newly discovered compounds, and to predict with some confidence the properties of a compound from its structural formula alone. Further progress was made by J. B. A. Dumas (1800-84), who showed that many properties of organic compounds were conditioned by the general structure of the molecule as a whole, and that, as long as this structure was broadly maintained, an electropositive element such as hydrogen might be partly or wholly replaced by such a typically electronegative element as chlorine without alteration of the fundamental nature of the compound so treated. While at first this theory of types appeared to be diametrically opposed to the radical theory, A. Laurent (1807-53) and C. F. Gerhardt (1816-56) showed that the 2 might easily be reconciled, since substitution of chlorine for hydrogen, and other such replacements, might well leave the general shape and position of the radicals unchanged, the 'derived' radicals being roughly similar in chemical character to the originals.

In 1852 Sir Edward Frankland (1825-1899) introduced the idea of valency (q.v.), or definite combining power of atoms, observing, for example, that 1 atom of phosphorus showed a tendency to combine with either 3 or 5 atoms of other elements, but no other number; the valency of phosphorus was therefore said to be 3 or 5. Hydrogen, on the other hand, has only 1 combining bond per atom, while oxygen has 2, so that to satisfy the combining power of 1 oxygen atom 2 hydrogen atoms are needed. The theory of valency, as applied to organic compounds, was greatly improved and extended by F. A. Kekulé (1829-96), who in 1858-68 showed that carbon uniformly has a valency of 4, and that carbon atoms have the remarkable and almost unique power of linking up together to form chains, rings, etc., which constitute the framework of the compound molecules. Thus butane,  $CH_3\cdot CH_2\cdot CH_2\cdot CH_3$ , has a straight chain of 4 carbon atoms:  $C-C-C-C$ ; isobutane,  $(CH_3)_2CH\cdot CH_3$ , a branched chain:

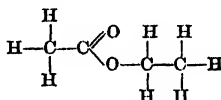
$\begin{array}{c} O \\ | \\ C \\ / \quad \backslash \\ C \quad C \end{array} - C$ ; and benzene  $C_6H_6$ , a closed chain or ring of 6 carbon atoms:



1922) introduced the system of denoting each valency bond, or unit of combining power, by a line, a neat device that at once rendered possible the clear and precise formulation of the supposed arrangement of atoms within a molecule. For example, the graphic formulae of (i) alcohol, and (ii) dimethyl ether are written as follows:



Similarly, the more complicated molecule of ethyl acetate is graphically represented as:



While such formulae undoubtedly indicate to some extent the actual spatial arrangements of the atoms in a molecule, they are more rightly to be regarded as an epitome of the chemical properties of the substances they represent, and their value is consequently in no wise diminished by modern theories and discoveries relating to the structure of the atom.

Remarkable evidence on this point is to be found in the facts of stereoisomerism (q.v.), a branch of O. C. founded by L. Pasteur (1822-96), J. H. van't Hoff (1852-1911), and J. A. Le Bel (1847-1930). They showed that the ordinary plane formulae were insufficient to account for certain cases of isomerism, e.g. that of the lactic acids, where 3 distinct compounds exist, all of which must be represented by the single plane formula,  $CH_3\cdot CH(OH)\cdot CO_2H$ , and van't Hoff and Le Bel independently and almost simultaneously in 1874 suggested that in such cases it is necessary to take into account the 3-dimensional structure of the molecules. It has, indeed, been found that wherever the molecules of a compound are asymmetric, the observed isomerism can be explained only by space formulae, and conversely, it has been possible to predict previously undiscovered isomers by a recognition of asymmetry in the molecules of a substance. Such isomerism (stereoisomerism) is not always accompanied by asymmetry, but when asymmetry is present the stereoisomers are distinguished by their optical effects on polarised light.

The rapid growth of O. C. in the last hundred years has been extraordinarily fruitful on the practical side, since the structure of many valuable natural products has been ascertained, and their manuf. by artificial methods from cheap sources rendered possible. Thus indigo, acetic acid, alizarin, and methyl alcohol, to name only a few, can now be prepared synthetically at a much lower cost than formerly; while the range of dyes, drugs,

explosives, etc., has been extended enormously by applications of the knowledge won by organic chemists. In the sphere of biochemistry (q.v.) O. C. is throwing light on the physiological basis of life, whilst in medicine it is now possible deliberately to build up new remedial and preventive substances of practically any desired character. In agriculture, horticulture, paper-making, brewing, tanning, and numerous other industries the organic chemist is playing an ever-increasing part, while the former art of perfumery is rapidly becoming a more specialised branch of the science of O. C.

**General.** Organic compounds are classed in sev. divs., of which the 2 principal are the fatty or aliphatic (q.v.) and the aromatic (q.v.). Aliphatic compounds, so called on account of the fact that the fats are among the most typical members of this div. (Gk *aleiphar*, fat), may theoretically be regarded as ultimately derived from methane or marsh gas,  $\text{CH}_4$ , while benzene and its derivatives are classed as aromatic. The main distinction in structure between the 2 groups is that the aromatic substances contain a closed chain nucleus of carbon

atoms, e.g. benzene,  $\text{HC} \begin{array}{c} \text{H} \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{H} \end{array} \text{CH}$ , and

naphthalene,  $\text{HC} \begin{array}{c} \text{H} \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{H} \end{array} \text{CH} \begin{array}{c} \text{H} \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{H} \end{array} \text{CH}$  while

the aliphatic compounds have open chains of carbon atoms, e.g. pentane,  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ . Heterocyclic compounds contain a closed ring consisting partly of carbon atoms and partly of other multivalent atoms, e.g. pyridine,

$\text{N} \begin{array}{c} \text{H} \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{H} \end{array} \text{CH}$ . Within each large div.

the compounds fall into well-defined homologous series. Any particular homologous series can be represented by an algebraic formula, e.g.  $\text{C}_n\text{H}_{2n+2}$  for the paraffin series, and any 2 consecutive members of a series differ in molecular constitution by 1 carbon atom and 2 hydrogen atoms. Thus methane,  $\text{CH}_4$ , ethane,  $\text{C}_2\text{H}_6$ , and propane,  $\text{C}_3\text{H}_8$ , are the first 3 members of the paraffins. All the members of a given series can be prepared by similar methods and show a general similarity of properties, 2 facts that do much to lighten the labour of the student of O. C. Some of the prin. classes of organic compounds are given below, with general formulae:

#### Aliphatic.

1. Paraffins,  $\text{C}_n\text{H}_{2n+2}$ .
2. Olefines,  $\text{C}_n\text{H}_{2n}$ .
3. Acetylenes,  $\text{C}_n\text{H}_{2n-2}$ .

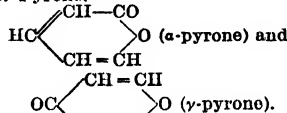
4. Alcohols, e.g.  $\text{C}_n\text{H}_{2n+1}\text{OH}$ .
5. Aldehydes, e.g.  $\text{C}_n\text{H}_{2n+1}\text{CHO}$ .
6. Fatty Acids,  $\text{C}_n\text{H}_{2n+1}\text{CO}_2\text{H}$ .
7. Ketones, e.g.  $\text{C}_n\text{H}_{2n+1}\text{CO}\cdot\text{C}_m\text{H}_{2m+1}$ .
8. Ethers,  $\text{C}_n\text{H}_{2n+1}\text{O}\cdot\text{C}_m\text{H}_{2m+1}$ .
9. Amines, e.g.  $\text{C}_n\text{H}_{2n+1}\text{NH}_2$ .
10. Amides, e.g.  $\text{C}_n\text{H}_{2n+1}\text{CO}\cdot\text{NH}_2$ .
11. Carbohydrates, e.g.  $\text{C}_6\text{H}_{12}\text{O}_6$ , glucose,  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ , cane-sugar, and  $(\text{C}_6\text{H}_{10}\text{O}_5)_n$ , starch.

#### Aromatic (benzene derivatives)

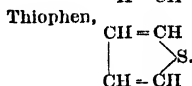
1. Benzene hydrocarbons,  $\text{C}_n\text{H}_{2n-6}$ .
2. Nitro-compounds, e.g.  $\text{C}_n\text{H}_{2n-7}\text{NO}_2$ .
3. Amino-compounds, e.g.  $\text{C}_n\text{H}_{2n-7}\text{NH}_2$ .
4. Phenols, e.g.  $\text{C}_n\text{H}_{2n-7}\text{OH}$ .
5. Sulphonic acids, e.g.  $\text{C}_n\text{H}_{2n-7}\text{SO}_3\text{H}$ .
6. Diazo-compounds, e.g.  $\text{C}_n\text{H}_{2n-7}\text{N}_2\text{Cl}$  (and aromatic alcohols, aldehydes, acids, ketones, ethers, amides, amines, etc.).

#### Heterocyclic.

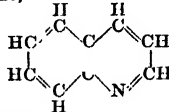
1. Pyridine,  $\text{C}_5\text{H}_5\text{N}$ .
2. Pyrone.



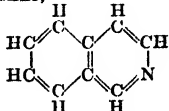
3. Pyrrole,  $\begin{array}{c} \text{CH} = \text{CH} \\ \diagdown \quad \diagup \\ \text{N} \end{array}$ .
4. Furan,  $\begin{array}{c} \text{CH} = \text{CH} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$ .



6. Quinoline,



7. Isoquinoline,



See H. Gilman, *Organic Chemistry*, vols. 1 and 2 (2nd ed.), 1943; vols. 3 and 4, 1953; and L. F. Fieser, *Organic Chemistry* 3rd ed.), 1956.

**Organic Husbandry**, practice of agriculture and horticulture in all their phases based upon the use of organic materials and natural methods, to the exclusion of chemical fertilisers, dusts, and sprays, and

artificial forcing of stock for their produce. The keynote is the law of return, whereby it is held that the residues of organic life, plant remains, animal and human excreta, etc., must be returned to the earth, and in decomposition stimulate the natural processes that restore and build soil fertility. A naturally fertile soil means healthy plants; healthy plant food means healthy animals and humans. The cycle is thereby complete, and high disease resistance means no need for insecticides, fungicides, or medicine. O. H. also embraces mixed, not specialised, farming, mixed crops rather than monoculture, and the use of soil-building plants and trees to prevent erosion. Theoretically it is held that chemical fertilisers disrupt the natural processes of nutrition, destroy an essential link between certain soil fungi (mycorrhiza) and plants, and so adversely affect plant and animal nutrition and health. In practice, O. H. is founded on the conservation of all plant and organic debris on farms and gardens, and their conversion into humus and plant foods via the compost heap. Composting methods vary in detail, but in principle consist of the stacking of mixed organic materials in layers, sandwich fashion. The thickest layers are of plant debris topped by thinner layers of animal matter (manure, etc.), which serve to accelerate decomposition. A dusting of lime may be added as an alkalinising base, and a sprinkle of soil. The sequence is repeated to form moist, aerated, flat-topped heaps with tapering sides, not less than 5 ft square and 4½ ft high. Heaps may be turned one or more times to restimulate rotting. Compost heaps can be made smaller than the dimensions stated above if given protection in a compost bin. In scarcity of animal manure, organic fertilisers (bone meal, hoof, and horn, dried blood, etc.) may be used. Finished compost is applied at any season. High handling and labour costs are the chief disadvantages. Sheet composting is practised on farms and consists of dressing green manure crops or spent pastures with farmyard manure and ploughing in by Aug.-Sept. Consistent stocking of the soil with organic matter improves it biologically and chemically, and the accretion of humus and plant nutrients gives sound fertility. See Sir A. Howard, *An Agricultural Testament*, 1940; F. H. Billington, *Compost*, 1942; Lady Eve Balfour, *The Living Soil*, 1943, 1947; Frank Sykes, *Humus and the Farmer*, 1946; E. Pfeiffer, *Soil Fertility, Renewal, and Preservation*, 1947; D. P. Hopkins, *Chemicals, Humus, and the Soil*, 1949.

**Organisation for European Economic Co-operation**, formed after the Foreign Aid Act authorising the Marshall Plan for European Recovery was signed by President Truman on 3 April 1948; the 16 European nations which had accepted the Marshall offer met in Paris to set up a joint organisation (i.e. the O.E.E.C.) which was intended to outlive the European Recovery Programme. The understanding was that European countries should come to an agreement upon the

economic assistance required from the U.S.A., and upon measures of self-help. A preliminary conference between Britain, France, and Russia, in 1947, broke down when the Soviet Union expressed its dislike of a European economic programme on the grounds that current arrangements would be disturbed and national sovereignty impaired. The other 2 countries, however, issued invitations to all European states save Spain to take part in measures of economic co-operation, the Soviet bloc refusing participation. A conference of the 16 participants was held in Paris, and ultimately outlined a plan for the restoration of European economy by the end of 1951. This was held to require 4 measures: the solving of the problem of Europe's trade deficit with America, estimated at \$22,440,000,000 for 1948-51; maximum mutual co-operation by the 16 nations; the estab. of internal financial stability; and maximum production by each participant. A convention in 1948 set out the constitution of the permanent O.E.E.C., namely, a council, an executive committee of 7, a secretariat, and sev. *ad hoc* committees.

After Marshall Aid ended, O.E.E.C. as originally envisaged continued to function, concentrating on the dollar problem which was common to most of its members, but also studying increasingly the questions of liberating inter-European trade and returning to currency convertibility. The European Payments Union, at present (1958) one of O.E.E.C.'s main functions, will cease to exist when convertibility is restored. Britain is an active member of O.E.E.C., which has admitted new members since its inception (e.g. the Federal Ger. Rep. was admitted Oct. 1949), the present (1958) chairman being D. Heathcoat Amory, Brit. chancellor of the exchequer.

**Organists**, Royal College of, see ROYAL.

**Organo-Metallic Compounds**. Compounds of metals with alkyl (e.g.  $C_2H_5$ ) or aryl (e.g.  $C_6H_5$ ) groups. They are colourless liquids with low boiling points. Many of them are decomposed by water with liberation of much heat, and burn in air often with explosive violence. Some compounds, e.g.  $Mg < \overset{Br}{C_2H_5}$ , contain halogen as well. These are known as Grignard's reagents. Thus to make magnesium ethyl bromide, *dry* magnesium (1 atom) is covered in a flask with *dry* ether and 1 molecule of ethyl bromide is added. A vigorous action sets in, and finally a solution of the Grignard reagent in ether is obtained. These reagents are very valuable aids in organic chemistry. Thus with water and alcohol they yield hydrocarbons; with oxygen they give alcohols; they react with halides of metals (and some non-metals); they absorb carbon dioxide and can be made to yield acids (carboxylic) by treating the product with a dilute mineral acid. Aldehydes can be converted into secondary alcohols, and so on.

O.-M. C. of the type  $Mg(C_2H_5)_2$ , can be made either by the action of an alkyl

halide with the metal, or by the action of zinc alkyl and the metallic chloride in question. Thus  $\text{Sn}(\text{C}_2\text{H}_5)_2$  can be made from stannic chloride and zinc ethyl.  $\text{Zn}(\text{C}_2\text{H}_5)_2$ . Zinc ethyl itself is a liquid which boils at  $118^\circ \text{C}$ . Aluminium methyl,  $\text{Al}(\text{CH}_3)_3$ , boils at  $130^\circ \text{C}$ . and reacts violently with water. Mercury, tin, lead, etc., yield compounds like  $\text{Hg}(\text{C}_2\text{H}_5)_2$ , whilst lead tetraethyl (q.v.) has found commercial application as an anti-knock reagent. Mercuric ethyl is obtained from zinc ethyl and mercuric chloride, and also by the action of ethyl iodide on sodium amalgam. It boils at  $159^\circ \text{C}$ ., is very poisonous, but does not oxidise easily in air.

**Organon** (Gk *organōn*, an instrument), name applied to the works of Aristotle (q.v.) on logic (q.v.). These were so called because logic is neither a speculative science nor, properly speaking, a practical art, but an instrument for use in all scientific thought. Francis Bacon entitled one of his treatises *Novum Organum*, professing to expound therein a new system of inductive logic.

**Oriani, Alfredo** (1852-1909), It. novelist and essayist, scarcely known outside Italy, is celebrated in his own land as the precursor of Fascism, and the Fascists undertook a national ed. of his works. He was born in Faenza, and here in his villa he passed most of his life. During his life he was practically ignored, but was later honoured not only by the Fascists, but also by the critic Benedetto Croce, and by the literary group of the jour. *Voce*. He was primarily a thinker, influenced especially by the philosophy of Hegel. He preached that Italy needed real unity; and that there was too much regionalism. To the tendency prevailing in his time he opposed the martial spirit. These ideas were especially set forth in *La lotta politica in Italia*, 1892, and *La rivolta ideale*, 1907. Also for a time he tried his hand at novels, which were marked by a pitiless realism, the fruit of his observation of the villagers around him. Among these were *Gelosia*, 1894, *La disfatta*, 1896, and *Olocasta*, 1902.

**Oribasius** (c. AD 325-403), Gk physician, native of Sardis or Pergamus, friend and physician of the Emperor Julian, accompanying him to Gaul (355) and to Persia (363). He became quaestor of Constantinople (361). O. was banished temporarily by Valentinian and Valens, but recalled in 370. O. was the greatest of the Byzantine physicians. Half of his *Medicinalia Collecta* (*Synagōgai Iatrikai*) is extant. It is compiled largely from Galen and others (see ed. of 1851-76), and is of importance as preserving the works of many medical writers of antiquity which would otherwise have been lost.

**Orid**, see **ORHID**.

**Oriel College**, Oxford, founded in 1326 by Edward II, prompted thereto by Adam de Brome, clerk in chancery. The name comes from a message in Oxford called *La Oriole*, which was demised to the college at its foundation, but the origin of this name is unknown. Famous members

of the college include Sir Walter Raleigh, Gilbert White, Thomas Hughes, and Cecil Rhodes. See G. C. Richards and H. E. Salter, *The Dean's Register of Oriel, 1446-1661*, 1926, and C. S. Emden, *Oriel Papers*, 1948.

**Oriel Window**, window projecting from an upper storey, and supported by a bracket or corbelling. O. W.s were commonly used in late Gothic civil architecture, especially in France and England.

**Orient Line**, now a subsidiary of the Peninsula and Oriental Steam Navigation Co. (q.v.), steamship line sailing between London and Australia which succeeded the old O. L. of sailing ships which used to ply between London and Adelaide. Its steamship service to Australia was started in 1878. At that time it sailed some of the Pacific Steam Navigation Co.'s ships, but this arrangement ended in 1901 and later the O. L. built a new fleet of 12,000-ton steamers to replace them. O. L. steamers call at Gibraltar, Marseilles, Naples, Port Said, Aden, and Colombo, on their way to Australia. The *Orcades* (28,000 tons gross), launched in Oct. 1947, was named after a new ship lost during the Second World War, and has a speed of  $22\frac{1}{2}$  knots; she can make the passage between England and Melbourne in 28 days. *Oronsay* (28,000 tons) sailed on her maiden voyage in 1951, and *Orsova* (29,000 tons) in 1954. At the beginning of 1954 the O. L. started a service across the Pacific from Australia calling at Auckland, Fiji, Honolulu, San Francisco, and Vancouver, whilst once a year eastbound and westbound O. liners sail round the world.

**Oriental and African Studies, School of**, a school of London Univ. (q.v.), founded in 1916 and opened 1917. In the amending charter of 1938 (which added the words 'and African' to the title and restated the purposes of the school), it is declared that its objects are to 'further research in and to extend the study and knowledge of the languages of Eastern and African peoples, ancient and modern, and the literature, hist., religion, law, customs, and art of those peoples. The courses are designed for the needs of persons about to proceed to the E. or to Africa for study and research, for the public service or commerce, or for the pursuit of a profession or calling.' The scope of the teaching covers culture and hist., including oriental art and archaeology, the literatures, religions, philosophies, and customs of oriental and African countries, social anthropology, phonetics, linguistics, law, courses for colonial service probationers, and commercial courses. The school is housed in modern buildings on the Bloomsbury site, and has a student body of about 600.

**Oriental Club**, see **CLUB**.

**Oriental Languages**, see **LINGUISTIC FAMILIES**.

**Oriental Plague**, see **PLAGUE**.

**Orientation**, determination of the points of the compass with special regard to the E.; in eccles. architecture the arrangement of a sacred building so that its main axis may point towards the E. In Gk temples the main door was at the E. end, and some

such custom was followed in the early Church. The altar was near the W. end, and the officiant faced the people standing still further W. Later the custom became estab. of placing the altar at or near the E. end, the priest officiating usually with his back to the congregation. (For orientation of Muslim mosques see MOSQUE.)

**Oriente:** 1. The most easterly and largest of the Cuban provs. (formerly Santiago de Cuba), covering an area of 14,132 sq. m. The prov. is mountainous in parts, but is drained by numerous streams and has some fertile valleys and plains. The highest mt peak is Turquino (8560 ft). The chief products are iron, copper, chromium, manganese, mercury, slate, marble, sugar, tobacco, fruit, cereals, coffee, honey, wax, petroleum, etc. Cap. Santiago. Pop. 1,798,185.

2. Region of Ecuador, on the E. side of the Andes. It is divided (since 1925) into the provs. of Napo-Pastaza and Santiago-Zamora. The main townships are Tena and Macas respectively. It comprises a large tract of country in the Amazon valley, and is crossed by many riva. An area rich in timber, rubber, and probably gold, its possession has been disputed by Ecuador, Peru, and Colombia. Area 219,095 sq. m., of which only 110,000 are inhabited. Pop. 50,354.

**Oriflammé** (Med. Lat. *auriflamma*), red flag of the abbey of St Denis, which the kings of France received from the abbot at their coronation. It was at first used only against infidels, but later was in general use, appearing for the last time at Agincourt. In the 15th cent. the O. was superseded by the blue standard powdered with fleurs-de-lis, and the last mention of the original O. is in the inventory of the abbey of St Denis dated 1531.

**Origanum**, genus of aromatic herbs and sub-shrubs (family Labiatae). *O. marjorana* is the sweet marjoram of gardens. *O. vulgare*, the common marjoram with purple or white flowers, is also aromatic. *O. dictamnus*, dittany of Crete, is a handsome pink-flowered plant often grown in hanging baskets. *O. onites* is the Pot Marjoram.

**Origen** (186-c. 254), the most famous and influential Christian writer of his age, b. Alexandria. His father, Leonidas, was martyred under Septimius Severus, 202, and O.'s mother had to restrain her son from following his father to death. He made such progress under Pantaenus and Clement that Demetrius, Bishop of Alexandria, allowed him to catechise when only 18. He was learned in Scripture and Gk philosophy alike, and so zealous in his asceticism that he took the counsel of Matt. xix. 12 literally and castrated himself. The persecution of Caracalla, 216, especially attacked the learned, and O. had to flee. He gave public lectures on the Bible in Palestine at the invitation of the bishops of Jerusalem and Caesarea, but Demetrius objected that he was not a priest and he returned to Alexandria. He revisited Palestine, c. 231, on his way to Greece, and the 2 bishops ordained him. Deme-

trius again objected that a eunuch could not be a priest, and an Alexandrian synod unfrocked O. and forbade him to teach. Palestine and other dioceses refused to accept this, and O. settled at Caesarea, which his fame soon made a rival to Alexandria for scholarship. O. was imprisoned and tortured in the Decian persecution, dying as a result of his sufferings. He was never reckoned a martyr or confessor, for his speculations were so bold that even in his lifetime he was sometimes suspected of heresy. Some of his ideas were later condemned, e.g. the pre-existence of souls; that the resurrection body would be solid and spherical (the perfect shape); and that all, even the devil himself, would ultimately be saved. His exegesis of the O.T. was critical, and he readily preferred the allegorical to the literal interpretation. His great work was the adaptation of Gk philosophy (especially the *Logos* doctrine) to Christian thought. Representing all that was the best in Christian scholarship of the first 3 cents., he was broad in his conceptions and tolerant in controversy. Among his works that survive in Greek or Latin, at least partially, are his commentaries on Matthew, John, and Romans, his *Fundamentals* (*Peri Archon*), his great apologetic *Against Celsus*, and over 300 homilies. The Berlin Academy began a definitive ed. of his works in 1899. See also the ed. of Lommatzsch (25 vols.), 1831-48; the Ante-Nicene Christian Library (Eng. trans.), *De Principiis*, 1869, and *Contra Celsum*, 1872; C. Bigg, *Christian Platonists of Alexandria*, 1886; E. Leigh-Bennett, *Handbook of the Early Fathers*, 1920; H. Chadwick, *Contra Celsum*, 1953; J. Danielou, *Origen*, 1955.

**Original Sin**, sinfulness inherent in human nature since the Fall (q.v.). That man is morally crippled and subject to sin is a fact of common experience, amply proved by hist. It is also a revealed truth of the Christian religion, which teaches that this debility is inherited from our first parents, and is the consequence and punishment of their failure under probation to obey the will of God. The doctrine is based in scripture on the story of Adam and Eve (Gen. ii and iii) as elaborated by St Paul, especially in Rom. v. It is also involved in the whole Christian belief in salvation and redemption through Jesus Christ. The doctrine is unanimously taught by the early Fathers (c.f. Irenaeus, *Adversus Haereses*, iii. 22, 14; Tertullian, *De testimonio animae*, iii; Origen, *Homilia in Jeremiam*, viii. 1). In the 4th cent. Pelagius (q.v.) denied it. Since the Reformation (q.v.) there has been controversy about the exact nature of O. S., and the spiritual consequences of the sin of Adam upon his human nature and that of his posterity. Rom. Catholic theology defines O. S. as 'the guilt and stain of sin which we inherit from Adam.' What this means is further specified as being the necessity of physical death, loss of supernatural grace, and a depraving of the intellect and will. See also BAPTISM.

**Orihuela**, Sp. tn in the prov. of Alicante,



on the Segura, in a fertile, irrigated garden region. It has a 14th-cent. cathedral, much restored, sev. other fine anct churches, and a 17th-cent. college. There is a large trade in oranges, wine, and oil, and textiles are manuf. Pop. 45,350.

**Orillia**, summer resort of Ontario, Canada, on Lake Couchiching in Simcoe co., 60 m. N. of Toronto. There are iron foundries and saw- and grist-mills, and factories for making motor-cars and agric. implements. Pop. 12,796.

**Orinoco**, third largest riv. of S. America, being next in importance to the Amazon and Plata. The new airport of Puerto Ordaz, and even more the new river port of San Félix (pop. 8000), are beginning to enhance its economic importance, providing as they do an outlet for the newly developed iron ore of the Cerro Bolívar. Its source is in the Sierra Parima, Venezuela, at an altitude of nearly 5000 ft, below Ferdinand de Lesseps Peak, 3° 40' N. lat. and 64° 30' W. long. Up to its junction with the Guaviare, which joins it on the l. b., W. of 68° W. long., it holds a generally WNW. course for 360 m. During this course, 20 m. past Esmeraldas it bifurcates on the l. b., at 3° 10' N. lat. and 66° 17' W. long., into the Casiquiare (q.v.) which links up at its S. extremity with the Rio Negro, a trib. of the Amazon, and on the r. b., it is joined by the Ventuari. From its confluence with the Guaviare it flows almost due E. across the llanos or joined on the l. b. by the Vichada and Meta, both in Colombia, and the Apure and its many tribs. in Venezuela, and descending from the highlands by the cataracts of Maipures (which are nearly 2 m. wide and some 660 yds long) and Atures (5 m. wide and 6 m. long). Between the mouths of the Guaviare and Meta it separates Venezuela from Colombia, but otherwise its entire course runs through Venezuelan ter. From the junction with the Apure the main stream flows almost due E., across the llanos or grassy plains to the Atlantic at 8° 20' to 10° 0' N. lat. In this part of its course the prin. tribs. are the Caura, Curoni, and Paragua, all in Venezuela, and all flowing from the S. The delta begins at 62° 30' W. long., 130 m. from its mouth, by throwing off a branch which flows N. into the Atlantic, and covers an area of 8500 sq. m. The Boca de Navios, between Brit. Guiana and Naima Isle, is the mouth mostly used, but 6 others are also navigable. The Boca de Navios is divided by a line of is. into 2 channels, each 2 m. in width. The water of the riv. is of a milky-white colour, and may be easily distinguished at a great distance.

The O., from its source in SE. Venezuela on the Brazilian border, thus describes a great semicircle, the estuary being no more than 500 m. from its source in the Sierra Parima, whilst its entire course is 1960 m., of which 900 m. below the Atures cataracts and 600 m. above the Maipures cataracts are navigable.

The head of uninterrupted navigation is at the confluence of the O. with the Apure, 777 m. from the mouth of the riv. During its upper course the O. flows between the

mts and dense forests of Venezuelan Guiana on the E., and the wide llanos of Colombia on the W.; but after it reaches the lowlands, below its junction with the Apure, it has mts on its l. b. or N. side and the plains on its r. b. At a distance of 150 m. from its source the riv. is only 90 yds wide; above its junction with the Casiquiare, at an altitude of 1000 ft, it is 650 yds wide; below its junction with the Apure, at an altitude of 200 ft, it is from 4 to 5 m. wide. In the flood season (April-Sept.), following the rains, the lower course becomes an immense lake, covering the llanos for some miles to the E. of the Apure. The area of the basin is about 370,000 sq. m.

**Orioles** are passeriform birds found only in the old world, and constitute the family Oriolidae; the Amer. O., or Baltimore birds (q.v.), belong to a separate family, the Icteridae. The birds are insectivorous and frugivorous, and hence are to be seen usually on forest trees. The plumage is generally very brilliant, and the male bird utters a flute-like note. *Oriolus oriolus*, the golden oriole, which is occasionally seen in Britain, is orange-yellow in colour with black markings; *O. kundoo* is the Indian mango-bird.

**Orion**, son of Hyrieus of Boeotia, a hunter, of great beauty, who loved Merope, the daughter of Oenopion of Chios, and for offering violence to her was blinded by Dionysus. He opened his eyes to the rising sun, and his sight was restored. He afterwards lived in Crete, and hunted with Artemis. According to one legend, he was slain by the bite of a scorpion.

**Orion**, most brilliant and interesting of the constellations, contains 3 splendid stars: Rigel (magnitude 0.3), Betelgeuse (0.9), Bellatrix (1.9), and 44 stars between magnitudes 4 and 5.2. The Great Nebula in O., which is just visible to the naked eye, is one of sev. nebulae in the constellation. It surrounds  $\theta$  Orionis, the middle star of the giant's sword (see NEBULAE). Betelgeuse (q.v.) is one of the largest stars visible. The stars in O. are not all at the same distance from the earth, Rigel being about 3 times as far away as Betelgeuse.

**Orion's Dog**, see CANIS MAJOR.

**O'Riordan**, Conal Holmes O'Connell (1874-1948), novelist and playwright, b. Dublin. In his earlier works he used the pseudonym F. Norreys Connell. His first book was *In the Green Park*, 1894, but his first real success was *The Fool and his Heart*, 1896, which was followed by *The Nigger Knights*, 1900, *Adam of Dublin*, 1920, with its sequels *Adam and Caroline*, 1921, and *Married Life*, 1924, *Rovena Barnes*, 1923, *Soldier Born*, 1927, *Soldier of Waterloo*, 1928, *Soldier's End*, 1938, and *Judith Quinn*, 1939. He succeeded J. M. Synge as director of the Abbey Theatre from 1909 to 1915, but his plays are not in the usual Abbey tradition. They include *Rope Enough*, 1913, *His Majesty's Pleasure*, 1925, and *The King's Wooing*, 1929.

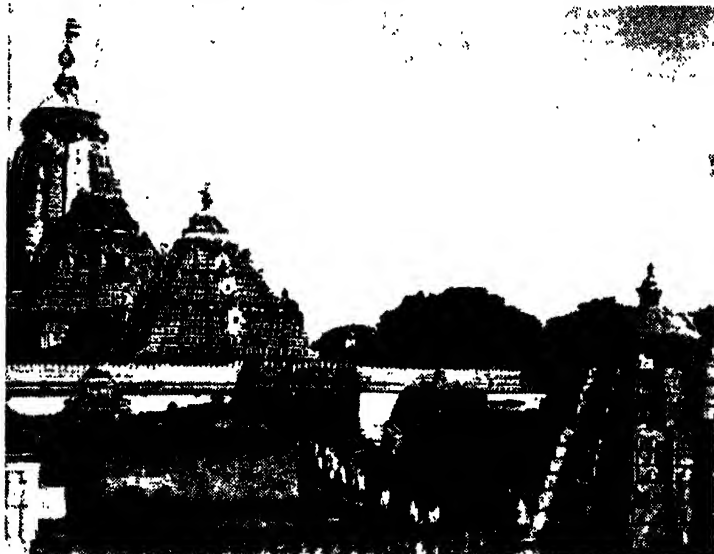
**Orissa**, state of India, formerly administered with Bihar (q.v.), lying along

the E. seaboard, with W. Bengal and Bihar to its N., Madhya Pradesh to the W., and Andhra Pradesh to the S. Its most important features are the great delta of the Mahanadi and the hilly tracts to the W. through which the Mahanadi gorge has provided the setting for the spectacular Hirakud Dam and reservoir. The hills are largely unproductive and forested; the delta is by contrast thickly populated, alluvial, and, near the sea, swampy lowland.

**History.** The Oriyas trace their hist. back to the anct kingdom of Utkal.

1957, is the world's longest; its reservoir (288 sq. m.) the greatest in the world. It is ultimately to irrigate 2 million ac. and provide 200,000 kw. of power. A second dam, the Machkund, will benefit O. and Andhra Pradesh on a smaller scale. Thus considerable development can be foreseen.

**Culture.** The state is a linguistic and cultural unit—Oriya is the language of the vast majority of the pop. It has many historic sites, and Puri, with the temple of Jagannath ('Juggernaut'), and Bhuvaneshwar, city of 500 temples and new cap. of O., are notable. The



*Indian National Railways*

PURI: JAGANNATH (JUGGERNAUT) TEMPLE

Their country was broken up in the period of Muslim domination. An Oriya awakening developed in the Brit. period. The isolated prov. was badly hit by a famine in 1866, which took 1,000,000 lives, after which the provision of better irrigation and rail communications was taken in hand. The Oriya demand for a separate prov. was conceded in 1936; after independence the rulers of 48 small princely states were persuaded to merge their kingdoms into O.

**Development.** Rice is grown on 9.5 million ac. out of 14 million ac. of cultivated land. Other grains, jute, cotton, and fruit are also produced. Much of India's iron ore is mined in O., and at Rourkela a steel plant is projected to yield 1 million tons a year (capital outlay Rs. 1,000,000,000). Some manganese, chrome, coal, and graphite are also mined. The Hirakud Dam, inaugurated in Jan.

new Utkal Univ. has 17 colleges affiliated to it.

**Government.** The governor acts through ministers responsible to an elected assembly of 140. O. is represented in India's Parliament by 10 members in the Upper and 20 in the Lower House. Other tns of note besides Bhuvaneshwar are Cuttack (pop. 103,000) and Puri (pop. 49,000). Area 60,140 sq. m.; pop. 14,400,000. *See also* BHUVANESHWAR and JAGANNATH.

**Oristano**, tn in Sardinia (q.v.), 55 m. NW. of Cagliari (q.v.). It has a cathedral and a 13th-cent. tower, is an important agric. centre, and has potteries. Pop. 17,300.

**Oriya Language**, *see* INDO-EUROPEAN LANGUAGES.

**Orizaba**, city of Mexico, in the state of Vera Cruz, 228 m. ESE. of Mexico city, altitude 4000 ft. It is reached from the

cap. via Puebla by the Mexican S. branch of the National Railway. There is considerable trade in sugar and tobacco, textiles are made, and there are railway workshops. The weaving of table linen is a new and thriving industry, and the tn is also noted for its wool sarapes. There are many silver- and gold-mines in the neighbourhood. Cattle-raising and agriculture are also carried on. The chief crop is coffee. The Mitla (q.v.) ruins are 25 m. SW. of the tn. In the vicinity is the slumbering volcano of O. or Citlaltépetl. Its last serious eruption was in 1566. Pop. 48,000.

**Orizonte** (Jan Frans van Bloemen) (1662-c. 1740), painter, b. Antwerp. He left his native tn for Italy early in life, and passed the remainder of his life in that country. His finest pictures are in the pontifical palace at Monte Cavallo. He was a follower of Poussin and particularly noted for his landscape paintings, being nicknamed 'Orizonte' by reason of the beauty and delicacy shown in his portrayal of distances. He had 2 brothers, also painters, viz. *Pieter van Bloemen*, called 'Standaart' (1657-1719), and *Norbert van Bloemen*, called 'Cephalus' (1670-1746).

**Orjonikidze**, see **ORDZHONIKIDZE**.

**Orjonikidzehrad**, see **BEZHITS**.

**Orkhon Inscriptions** (also known as **Siberian, Early Turki, Pre-Islamic Turki** or **Kök Turki Runes**) are the earliest epigraphical monuments written in Turki; and the earliest alphabetic inscriptions discovered in N. central Asia. They belong to the 7th and 8th cents. AD. Some of them are long funerary inscriptions, describing the war glories of the T'u-küe, the earliest known Turki people, who ruled over Mongolia from the mid 6th cent. AD to the mid 8th cent. These inscriptions were found on the Upper Ob, the Upper Yenisei, and particularly on the R. Orkhon, to the S. of Lake Balkal. The inscriptions are written either in horizontal lines running, like the Semitic alphabets, from right to left, or vertically (perhaps under Chinese influence) in columns following each other from right to left. This script was deciphered in 1893 by the Dan. scholar W. Thomsen. The language of the inscriptions is early Turki, the oldest form known of the Turkish tongue, which differs very widely from Osmanli Turkish. The script, which must have already been in use in the 6th cent. AD, consists of 38 letters, of which 4 are vowels (*a, y, u, ö* or *ü*); curiously enough, many consonants vary in form according to the following vowel-sound, e.g. *k* has as many as 5 forms (for writing (1) *ka*, (2) *ky*, (3) *ko* or *ku*, (4) *kü*, *ke*, *ki*, and (5) *kö* or *kü*). The origin of this script is uncertain; it may have derived from a local Pahlavik script (see **PAHLAVI**) or from the Sogdian alphabet (see **ALPHABET**).

There are 2 forms of the Orkhon script, the monumental, of which a few varieties are known, and which externally resembles the Teutonic runes, and the cursive form, the script of various fragments at Turfan (E. or Chinese Turkestan).

**Orkney and Shetland, Duke of**, see **BOTHWELL, EARL OF**.

**Orkney Islands**, separated from Caithness by the Pentland Firth (q.v.), lie between 58° 41' 24" and 59° 23' 2" N. lat. and between 2° 22' 2" and 3° 25' 10" W. long.; and are 73 in number at low water, of which 28, besides Mainland, or Pomona, are inhabited.

Many brochs, chambered cairns, and burial mounds remain as evidence of prehistoric and Norse settlements. The Neolithic dwellings of Skara Brae are important examples. The Orkneys, under the name Orkades, are mentioned by the anc. geographers, Pliny, Ptolemy, and others. In 876 Harald Haarfager conquered both them and the Hebrides. During the greater part of the 10th cent. they were ruled by independent Scandinavian jarls (earls), but in 1093 they became formally subject to the Norwegian crown. Thus they remained Scandinavian till 1468, when they were given to James III of Scotland as a security for the dowry of his wife, Margaret of Denmark. The is. were never redeemed from this pledge; and in 1590, on the marriage of James VI with the Dan. Princess Anne, Denmark formally resigned all pretensions to the sovereignty of the Orkneys. During their long connection, however, with Norway and Denmark, all traces of the primitive Celtic pop. disappeared, and the present inhab. are of the pure Scandinavian stock.

The surface is very irregular, and the land is indented by numerous arms of the sea. Next to Mainland, the most important of the is. are N. and S. Ronaldshay, Hoy, Rousay, Stronsay, Flotta, Shapinsay, Eday, and Sanday. The highest peak is Ward Hill in Hoy, which has an elevation of 1560 ft. The temp. of the O. I. is comparatively mild, considering their N. lat. This is due chiefly to the proximity of the Gulf Stream. There is little difference in temp. between day and night; and frost and snow are rare. The rainfall averages 36½ in. At the season of the 'longest day' there is no darkness for about 6 weeks and during the summer solstice snapshots can be taken at midnight. The exports are chiefly agric. produce, and cattle. The chief tns are Kirkwall, the cap., and Stromness. The Orkney and Shetland (q.v.) Is. return one member to Parliament. The area of the O. I. is 376 sq. m.; pop. 21,258.

See J. Gunn (ed.), *The Orkney Book*, 1909; A. W. Brögger, *Ancient Emigrants, Norse Settlements*, 1929; V. G. Childe, *Skara Brae*, 1931; J. S. Clouston, *A History of the Orkneys*, 1932; H. Marwick, *Orkney*, 1951.

**Orlando, Vittorio Emanuele** (1860-1952), It. jurist and statesman, b. Sicily, became a prof. of constitutional law at Palermo. He became minister of the interior in Boselli's Cabinet (1916). He succeeded Boselli as premier in 1917, and proved a tower of strength at the time of Cadorna's (q.v.) disastrous defeat at Caporetto (q.v.) by stiffening the national resistance. In the Inter-Allied Peace Conference in Paris, 1919, he was one of the

'Big Four' (see PEACE CONFERENCE). He seceded from the council in May 1919 on the Fiume question. Retiring from politics after Mussolini came to power, he returned to the Constituent Assembly to fight against the peace treaty after the Second World War, but, on the Chamber's approval of the treaty, he resigned his seat.

**Orlando**, tn in Florida, U.S.A., co. seat of Orange co., 125 m. S. of Jacksonville, and the state's largest inland city. It is a citrus-fruit packing and shipping centre; there are canneries and nurseries, and the manufs. include sheet-metal and concrete products, machinery, fertilisers, mirrors, and boxes. Pop. 52,367.

**Orléanais**, anct. prov. of France, the Pagus Aurelianensis of the Romans. It corresponded to the present depts of Loiret, Loir-et-Cher, and Eure-et-Loir, and parts of Seine-et-Oise, and Nièvre. The cap. was Orléans.

**Orléans, Dukes of**. The title of Duke of O. was created by Philip VI, and conferred on his son Philip. When the 3rd duke ascended the throne of France as Louis XII in 1498, the duchy lapsed. Louis XIII in 1626 bestowed the title of Duke of O. on Jean Baptiste Gaston, a son of Henry IV, but the title was not revived after his death until, in 1660, Louis XIV revived it in favour of his brother Philip. Descendants of this line are living at the present time; a brief account of the prin. persons who have held the title follows:

**Louis** (1372-1407), younger son of Charles V, was previously Count of Valois and of Beaumont-sur-Oise and Duke of Touraine, being created Duke of O. in 1392. He married Valentina, daughter of the Duke of Milan. His quarrel with Philip II, Duke of Burgundy, on the question of his wife's claims to Milan culminated after the death of Philip in his being murdered by one of the partisans of John, Philip's successor.

**Charles** (1391-1465), commonly called Charles d'Orléans, was the eldest son of the above duke. He married Isabella, the widow of Richard II of England, in 1406; in 1415 he was captured at Agincourt, and kept a prisoner in England until Nov. 1440. He spent most of the rest of his life at Blois, where he held a literary court. He is one of the finest of the late medieval Fr. poets, his rondeaux being outstanding for their poignancy and grace.

**Jean Baptiste Gaston** (1608-60), was the third son of Henry IV and Marie de Medici. Until 1638 he was heir to the throne. He intrigued continually and unsuccessfully against the Crown, and was eventually exiled from Paris.

**Philippe I** (1640-1701), the son of Louis XIII of France, was created Duke of O. in 1661, and married Henrietta, sister of Charles II of England, the same year. After her death (supposed to have been by poison at the duke's instigation) he married Charlotte Elizabeth, daughter of Charles Louis, elector-palatine of the Rhine. He had a distinguished military career.

**Philippe II** (1674-1723), regent of France, the son of the above. On the death of Louis XIV, he became sole regent and on Louis XV attaining his majority in 1723 Philippe continued in power as his Prime Minister. It was during his regency that the schemes of John Law (q.v.), the Scottish financier, which Philippe encouraged, brought the country to the verge of bankruptcy. A notorious libertine, Philippe was also a patron of the arts and philosophy.

**Louis Philippe Joseph (Egalité)** (1747-1793), b. St Cloud, was principally notable for his democratic views during the revolution, when he took the name of Philippe Egalité, and voted for the death of Louis XVI, his cousin. He was, however, subsequently guillotined. His son later became king as Louis Philippe (q.v.).

**Henri (Prince of Orleans)** (1867-1901), b. Ham, near Richmond. He was chiefly noted as a traveller and explorer, discovering the source of the Irrawadi, for which he received the medal of the Geographical Society of Paris.

**Louis Philippe Robert** (1869-1926), b. Twickenham and educ. in France till 1886; he returned there in 1890 and expressed a wish to serve as a conscript, but was imprisoned for a short period. He later served with the Brit. Army in India. On his death, without issue, Jean, Duke of Guise, became pretender to the Fr. crown, being succeeded in 1940 by his son Henri, Comte de Paris. See M. Coryn, *House of Orleans*, 1936.

**Orléans, Maid of**, see JOAN OF ARC.

**Orléans**, Fr. tn, cap. of the dept of Loiret, on the r. b. of the Loire. Caesar called it *Conanabum*; in later imperial times it was known as *Civitas Aureliani*, and was the anct. cap. of the prov. of Orléanais (q.v.). In 1429 Joan of Arc (q.v.), the Maid of O., began her mission to free France from the English, by forcing the Eng. troops under the Duke of Bedford to raise the siege of the tn. It suffered severely in the Huguenot troubles, in the Franco-Ger. war (q.v.), and in the Second World War. It is the seat of a bishopric. Its fine cathedral is a rebuilding since the 17th cent. of a previous structure destroyed in the religious wars. There are many anct. buildings and monuments, including churches, mansions, and an impressive museum, formerly the tn hall. Dolet (q.v.) was b. here. It is a road, rail, and canal junction. There is an extensive trade in agric. produce and wine, and machinery, confectionery, and textiles are manuf. Pop. 76,450.

**Orléans, Isle of**, is. of Quebec, just below Quebec City, on the R. St Lawrence. It is a fertile spot 21 m. long, with an area of 69 sq. m., and is noted as a summer resort.

**Orley, Bernaert van** (c. 1490-c. 1542), Flem. painter, b. Brussels. He studied Raphael at Rome, and later was appointed painter to Margaret of Austria. He made a number of designs for tapestry, the most celebrated being 'The Life of Abraham' at Hampton Court, and 'Maximilian's Hunts' in the Louvre.

**Orloff Diamond**, see DIAMOND.

**Orm**, or Ormin, see ORMULUND.

**Ormazd** (a corruption of the Pahlavi for *Ahura Mazda*, 'Lord Wisdom'), the god of goodness and light, creator of all that is good, and in perpetual conflict with *Ahriman* (q.v.), the god of evil, over whom he will certainly, with man's help, prevail, according to Zoroastrianism and the *Parsees* (qq.v.).

**Orme, Robert** (1728-1801), historian of India, b. Njengo on the Malabar coast, went to Calcutta in 1742, and entered the E. India Co.'s Service. In 1752 he pub. *A General Idea of the Government and People of Indostan*. He was appointed a member of the council at Madras 2 years later. Returning to England in 1760, he began his *History of the Military Transactions of the British Nation in Indostan from the year 1745, 1763-78*. His work is valuable as an early record of Brit. Indian events.

**Orme's Head.** The Great O. H. is a conspicuous limestone promontory W. of Llandudno (q.v.), rising to 679 ft above the Irish Sea. The lighthouse is visible at a distance of 24 m. The Little O. H., 463 ft, lies to the E.

**Ormesby**, par. and vil. of N. Riding, Yorks, England, 3 m. SE. of Middlesbrough. Pop. 2621.

**Ormoc**, or **MacArthur**, city of Leyte, Philippine Is., on the W. coast, 32 m. SW. of Tacloban. Sugar milling is carried on, and rice and sugar are exported. It was used by the Japanese as a supply port during the Second World War (up to 1944). In 1950 its name was changed to MacArthur. Pop. 72,730.

**Ormolu** (Fr. or *moulu*, ground gold), brass containing copper with about 40 per cent. of zinc, and of a golden-yellow colour. The prin. use of O. is for the mountings of furniture. Small articles are made from O., and it is also a basis for cloisonné work, produced in China for a long period.

**Ormond**, old name for Tipperary (q.v.).

**Ormonde, James Butler**, 1st Duke of (1610-88), succeeded as twelfth Earl of O. in 1633, and in 1661 was created duke in the Irish, and in 1682 duke in the English, peerage. He acted for Charles I against the Irish rebels in 1643, and in the following year was appointed lord-lieutenant of Ireland. In 1648 he was royalist commander in Ireland, where, after the execution of the king, he proclaimed Charles II. He was defeated by Cromwell in 1649, and fled abroad to join the king. On the restoration he was made lord steward of the household, and was again lord-lieutenant of Ireland in 1661-9, and 1677-82, and once more in 1684. After James II came to the throne he retired into private life, but in 1687-8 he opposed sev. of the more arbitrary acts of the king, and especially those directed against Protestantism.

**Ormonde, James Butler**, 2nd Duke of (1665-1745), eldest surviving son of Thomas, Earl of Ossory, succeeded to the dukedom in 1688. He was a supporter of William and Mary and at their coronation acted as lord high constable. He commanded the Life Guards at the battle of the Boyne, and was present at the battle

of Steinkerk. He was taken prisoner at the battle of Landen, but was exchanged for the Duke of Berwick. Under Anne he held the offices of lord-lieutenant of Ireland and captain-general of the forces. From the latter office he was removed on the accession of George I, and in 1715, as a leader of the King Jacobites, was impeached, but escaped to France. He now threw in his lot with the Pretender (see STUART, JAMES) and took part in the rising of 1715, and 4 years later accepted the command of the abortive expedition of the Sp. fleet to England. See JACOBITES.

**Ormskirk**, urb. dist. of Lancs, England, 12 m. NE. of Liverpool, and famous for its anct. street market held under royal charter for over 700 years. The par. church with both tower and spire has tombs of the Stanley earls of Derby. The grammar school is 17th cent. At Lathom are the ruins of Burscough Priory, and also of Lathom House, the old seat of the Lathams and Stanleys. O. has brass foundries, an ordnance depot, and cake and biscuit factories. It is celebrated for gingerbread. Pop. 21,500.

**Ormulum**, M.E. metrical trans. of the gospel hist., consisting of a series of Eng. homilies in iambic verse written by Orin or Ormin, canon of St Augustine in the vicinity of Lincoln, about 1200. It comprises some 10,000 lines which have neither rhyme nor alliteration; the author uses a partly phonetic spelling, which provides valuable data for the philologist. See also under ENGLISH LANGUAGE. See ed. of R. M. White, 1862 (revised by R. Holt, 1878) and P. Lambertz, *Die Sprache des Ormulum nach der lütlichen Seile untersucht*, 1904.

**Ormuz**, see **HORMUZ**.

**Ornaments**, Musical, notes which are not a part of the melody or harmony, but merely embellishments thereof. Some are now regarded as superfluous, either because the fashion of highly ornamented playing and singing is dead or because great elaboration is not suited to modern instruments. Some of the embellishments that were indispensable to the harpsichord, for example, because of its inability to give prominence to certain notes by accentuation, sound to modern ears merely fussy on the pianoforte. But the revival of old instruments, and of interest in the performance on them of the music originally written for them, has made a careful and scholarly study of old O. imperative nowadays. O. may be divided into main families, each of which has numerous subsidiary members: Appoggiatura, Shake, Mordent, Turn, Acciaccatura, etc.

**Orne**: 1. Dept of NW. France, formed from part of anct. Normandy, and divided into the arrons. of Alençon, Argentan, and Mortagne; cap. Alençon. It comprises 2 distinct physical regions, viz. the W., consisting of rugged hills and extensive forests, with patches of pastureland occasionally interspersed, and the E. with fertile valleys and rich pasture lands. Iron, copper, lead, and granite are the

prin. minerals. Cereals are cultivated to a certain extent, but more care and attention are given to the apple and pear orchards, for the raising of cider and perry. The dept is famous for its horses, and cattle are reared and dairy produce exported. Iron wares, linens, cotton, lace, glass, and leather goods are the prin. manufs. The dept was the scene of heavy fighting in 1944. Area 2371 sq. m.; pop. 273,200.

2. Riv. of France rising in the O. dept, and flowing generally NW. for half its course and NE. for the remainder, reaches the English Channel in the Bay of the Seine. Length 80 m. Argentan, Thury-Harcourt and Caen are on its banks; between the last 2 tns the valley of the O. is very picturesque and is called the 'Norman Switzerland.'

**Ornithocephalus**, small genus of epiphyt. orchids, natives of tropical America. *O. grandiflorus* bears racemes of white and green flowers, and the suggestion of the bird's beak, which gives the genus its name, is found in the long slender rostellum to which the pollen masses are attached. The plant is usually grown in peat and sphagnum in a small pan suspended near the roof of a greenhouse.

**Ornithogalum**, or **Star of Bethlehem**, genus of bulbous plants (family Liliaceae), bearing racemes of white, greenish-white, or yellow flowers. The only true Brit. species is *O. pyrenaicum*, Bath Asparagus or the spiked star of Bethlehem. *O. nudans* and *O. umbellatum* are naturalised in Britain, and others are grown in warm borders or as pot plants.

**Ornithoglossum**, genus of bulbous plants (family Liliaceae), occasionally grown in the greenhouse. *O. glaucum*, with greenish-brown flowers, and *O. undulatum*, with purple-green flowers, both natives of S. Africa, are the prin. species.

**Ornithology**, branch of zoology which teaches the hist. of birds. See BIRD.

**Ornithopter**, a flapping-wing flying-machine derived from the action of birds, a type conceived by Leonardo da Vinci about 1500, and by others since. No full-size O. has flown, but numerous models have been successful. See AEROPLANE.

**Oro**, or **El Oro**, Pacific prov. of SW. Ecuador. Cacao is the prin. product, and gold is found in Zaruma. The cap. is Machala. Area 3134 sq. m.; pop. 108,820.

**Orobanchaceae**, family of leafless, scaly, succulent plants, which are parasitical on the roots of other plants or which live upon decaying organic matter. Among the genera are *Orobanche* and *Lathraea*, both of which are represented by Brit. species.

**Orobanche**, or **Broomrape**, family Orobanchaceae, genus of parasitic plants with close spikes of flowers, brown, purple to yellowish-white. Species native to Britain include *O. purpurea*, Purple Broomrape, parasitic on Milfoil; *O. rapum-genistae*, Greater Broomrape, parasitic on Gorse and Brooms; *O. alba*, Red Broomrape, parasitic on Thyme; *O. minor*, Lesser Broomrape, parasitic on Clovers; *O. hederac*, Ivy Broomrape, found only on Ivy, and others.

**Orobis**, or **Bitter Vetch**, see LATHYRUS. **Orogeny**, see MOUNTAIN BUILDING PERIOD.

**Oromocto**, vil. in New Brunswick, Canada, about 10 m. SE. of Fredericton. Its selection as H.Q. area for Camp Gagetown, the largest army training area in Canada, has given it considerable importance. Camp Gagetown has an area of nearly 600 sq. m. and will have complete training facilities for an army division. It is expected that within a few years the area around O. will have a pop. of at least 10,000.

**Oronsay**, see COLONSAY and ORONSAY. **Orontes**, or **Nahr-el-Asi** (The Rebel-lous), riv. of N. Syria and Turkey, which rises in the Lebanon, and flows first N., through Homs, to Antioch, and then turns WSW., and enters the Mediterranean Sea, 40 m. N. of Latakia. Length 250 m.

**Orooniab**, see KEZA'ITYEH.

**Oropesa** Float, mine-sweeping device comprising a pear-shaped float on the end of a wire and moving at an angle to the ship. The wire is held to a set depth by a kite, and cuts the mooring cable of mines by being serrated. See MINES, MILITARY AND NAVAL.

**Oropus**, anct tn and seaport of Greece in Attica, 23 m. N. of Athens. Its possession was the source of continual strife between the Athenians and Boeotians from the 6th cent. BC to 338 BC, when it came into undisputed possession of the Athenians.

**Oroya**, cap. of Yauli prov., Peru, 137 m. from Callao, at the junction of the Central Railway and the Cerro de Pasco Railway. The tn, which stands at an altitude of 12,180 ft, is situated at the confluence of the Mantaro and Yauli R.s. The chief activity is the smelting of copper ore and various other metals. Pop. 15,000.

**Orpen**, Sir William Newenham Montague (1878-1931), painter, son of Arthur Herbert O. of Stillorgan, co. Dublin. At the age of 11 he went to the Metropolitan School of Art, Dublin, and, later, to the Slade School. O. was one of the artists chosen by the gov. to paint pictures of the First World War, being given the rank of major. He was knighted in 1918, and in 1921 he became president of the International Society of Painters and Gravers. His war pictures, many of which he presented to the nation, show scenes, tragic, comic, and grotesque, according as the subject struck his fancy; they are forceful and to the point, but artistically remain accidental dramatisations of his emotions rather than generalisations. Among the best known of these are 'Changing Billets' and 'Bombing at Night.' His best pictures are genre subjects and interiors with figures such as 'The Fracture,' 'Homage to Manet,' 'A Bloomsbury Family' (that of Mr Wm Nicholson). He painted many portraits, including 'The Hon. Percy Wyndham,' 1907, a notable early example of his powers, 'Dame Madge Kendal,' and 'Sir Ray Lankester,' all of a rather mechanical brilliance. A portrait of himself holding a 'Dead Ptarmigan,' and another of 'Alfred W. Rich, Esq.,' are

examples of excellent sketching. Among his pictures of Irish life, 'The Irish Wedding' and 'Sowing the Seed in the West' are greatly admired. Undoubtedly a great draughtsman, as a painter he was rather the brilliant executant than the great craftsman. See memoir by P. G. Konody and S. Dark, 1932.

**Orpheus**, legendary son of Oeagrus by the muse Calliope, and the most illustrious poet of the pre-Homeric period. He lived in Thrace, and became an Argonaut. O. was presented by Apollo with a lyre, on which he played so exquisitely that not only every living thing but rivers and rocks were moved by his music, and obeyed his will. He married the nymph Eurydice, who died from a serpent's sting. Resolved to recover her, O. dared to descend

myth developed a school of mystic theology which flourished at Athens during the 6th cent. BC. O. resembled the Thracian worship of Dionysus (q.v.).

**Orpiment**, native trisulphide of arsenic which occurs in lemon-coloured crystals in Czechoslovakia, Rumania, the U.S.A., Kurdistan, and elsewhere. Formerly it was used as a dye.

**Orpington**, urb. dist. of Kent, England, 5 m. SE. of Bromley, mainly residential and agric. There was a printing press here in 1873 for printing Ruskin's own works, superintended by George Allen, who was also his publisher. Charles Darwin lived (1842-82) at Downe, where he did all his greatest work. The parl. constituency of O. includes part of the Dartford rural dist. Pop. (estimated) 64,480.

**Orr**, John Boyd, see BOYD ORR.

**Orell**, tn. of Lancs, England, 4 m. WSW. of Wigan. There is a cotton-mill, sand and gravel quarry, and farming in the neighbourhood. Pop. 9400.

**Orrery**, Earls of, see BOYLE.

**Orrery**, instrument deriving its name from the one constructed for Charles Boyle, Earl of Orrery, by Rowley, 1715. It was an improved form of 16th-cent. planetarium (a machine for exhibiting the relative motions of the planets and their positions in respect to the sun and one another) invented, or at least constructed, by George Graham (1672-1750), and showed the motions of the members of the solar system, with relative sizes and distances, but circular orbits, by means of arms and uprights moved by geared wheels. A good example is to be seen in the Kelvingrove Museum, Glasgow, and Thomas Tompion, the famous London clockmaker, also constructed an O.

**Orris Root**, rhizome of *Iris florentina*, a violet-scented plant occurring in S. Europe. A starch or flour is prepared from the rhizome for use in the manuf. of toilet powders, especially dentifrices. The plant is cultivated for the purpose in the N. of Italy, and is sometimes grown in Brit. gardens.

**Orrs**, Eugenio d' (1882- ), art critic, was b. Catalonia. He became director of public instruction in Barcelona. Under the *nom de plume* of Xenius he was regarded as the champion of catalanism. About 1920, however, he began to separate himself from his Catalan friends, and to write in Castilian. As art critic he has been one of those who battled for fuller recognition of what Portugal contributed to art. One of his finest books is his life of Goya.

**Orsay**, see D'ORSAY.

**Orsborn**, Albert William Thomas (b. 1886), see SALVATION ARMY.

**Orsett**, see THURROCK.

**Orsini**, Giovanni Gaetano, see NICHOLAS (popes), *Nicholas III.*

**Orsk**, tn in Ozenburg oblast of S. Urals, on R. Ural, 140 m. SE. of Ozenburg. It is the centre of the rapidly developing Orsk-Khallovo industrial area (iron and steel, non-ferrous metallurgy). O. itself has heavy engineering, oil-cracking (pipeline from Gur'yev in the Emba oilfields),



THE DEATH OF ORPHEUS  
A vase in the British Museum.

into Hades. For this sad story see EURYDICE. In his grief O. retired to the mt caves and scorned the advances of the Thracian women, who, in revenge, tore him limb from limb in frenzy and threw his head into the Hebrus. The Muses collected his remains and buried them at the foot of Olympus, while Zeus placed his lyre among the stars. See W. K. C. Guthrie, *Orpheus and Greek Religion* (2nd revised ed.), 1952.

**Orphica**, number of early Gk poems on mystic subjects. They were once ascribed to Orpheus, but many of them were written during the 4th cent. AD. The chief poems of the Orphic cycle are the *Argonautica*, an epic poem on the voyage of the Argonauts; *Lithica*, a poem on the properties of stones; *Physica*; and *Minyas*. See A. Dietrich, *De Hymnis Orphicis*, 1891; eds. of the *Orphica* by Hermann, 1805, and Abel, 1885; Eng. trans. of the *Hymns* by T. Taylor, new ed., 1896.

**Orphism**. Around the Orpheus (q.v.)

and meat-packing plants. It was founded in 1735 as a Russian fortress; before the 1930's it had a cattle trade. Pop. (1956) 157,000 (1926, 14,000; 1939, 66,000).

**Orşova**, tn of Rumania, on opposite banks of the Cerna at its confluence with the Danube, at the Iron Gates. Old O., on the W. bank of the R. Cerna, is a trading and shipping centre. New O., on the opposite bank, was repeatedly taken and retaken in the wars of the 18th cent. Pop. (1948) 5107.

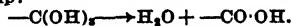
**Ortega y Gasset, José** (1883-1955), Sp. writer and philosopher, b. Madrid. He studied at Madrid and in Germany, and became prof. of metaphysics at Madrid. His first book of importance is *España invertebrada*, 1921, showing a marked pro-Ger. attitude. *El tema de nuestro tiempo*, 1923, estab. his philosophical position of 'vitalism.' In his famous *La rebelión de las masas*, 1930, he prophesied the doom of Europe. He was essentially a journalist, and many of his books appeared first as articles in the *Revista de Occidente*, which he had founded. His wide range of ideas, his preoccupation with the present, and his lively style, make him a stimulating rather than a profound writer. His *Obras completas* were pub. in 6 vols., 1946-7, and have been trans. into many European languages. See J. Sánchez Villaseños, *Ortega y Gasset, pensamiento y trayectoria*, 1945.

**Ortegal**, Cape, promontory, the most N.-westerly point of Spain, on the Bay of Biscay, 35 m. NE. of La Coruña (q.v.). In a naval battle off the cape in 1805, Sir Richard Strachan defeated a small Fr. fleet, survivors of Trafalgar, all the ships of which were captured or sunk.

**Ortelius, Wortsels (Ortel, or Ortell) Abraham** (1527-98), Flemish geographer and mathematician, b. Antwerp, of Ger. parents. His *Theatrum orbis Terrarum*, 1570, was the first modern atlas, and he also wrote *Synonymia Geographica*, 1578. In 1575 he was appointed geographer to Philip II of Spain, and 2 years later he came to England and helped to induce Camden to produce his *Britannia*.

**Orthez**, Fr. tn in the dept of Basses-Pyrénées, on the Pau. In the 13th cent. it was cap. of Béarn (q.v.), and it was, later, a Huguenot (q.v.) centre. Wellington defeated Soult here in 1814 during the Peninsular War (q.v.). The tn has a 14th-cent. bridge and an anct keep. There are metallurgical and textile industries. Pop. 6500.

**Ortho-acids**, name applied to substances containing one or more —C(OH)<sub>2</sub> groups. They are known in the form of their derivatives, the free acids being unstable, rapidly losing water with the formation of ordinary acids containing the —CO·OH group:



**Orthochromatic**, see PHOTOGRAPHY.  
**Orthodox Church**, see EASTERN ORTHODOX CHURCH.

**Orthography** (Gk *orthos*, correct; *graphein*, to write), art of setting down words correctly as regards their component letters according to accepted usage; in

other words, the art of accurate spelling; indeed, the term 'correct spelling' may be regarded as synonymous with O. Accurate spelling should properly be a reliable guide to the pronunciation of the word spelt, but since the number of symbols used for the representation of speech seems always to have been less than the number of sounds used, it is probable that O. has never perfectly served its purpose. Italian and Spanish are still mainly phonetic, German is less so, while in English and French the spelling is almost an arbitrary symbolism. Before the Conquest English was more or less phonetic. During the period from the Conquest to the introduction of printing, roughly, that is to say, during the M.E. period (see ENGLISH LANGUAGE), the same state continued. Even at this time, however, the need of reform was felt, as is shown by Orm or Ormin's attempt at phonetic spelling, the O. of the *Ormulum* (q.v.) being the most valuable extant source of information on the development of sound in M.E. During the M.E. period pronunciation and dialect varied in the sev. parts of the country. The spelling often differed. There were conventional representations of the various sounds, but there were not conventional representations of whole words. Even the introduction of printing did not finally fix O., and the attempt was still made to make the spelling of the word represent the pronunciation. The control of spelling passed from the writers themselves (or rather their scribes) to the printers, who did what they pleased with an author's spelling. The 16th and 17th cents. show a considerable degree of variation in spelling; a phonetic basis for O. had been largely abandoned, but a uniformity based on prevailing usage had not yet been estab. Pronunciation, moreover, went on changing, and now the spelling has not only ceased to be a guide to pronunciation, but in many cases it has become a positive hindrance. Only in the 18th cent. (with Dr Samuel Johnson's *Dictionary*), and particularly in the 19th cent., did Eng. spelling become quite firmly fixed. It seems hardly necessary to cite examples to prove the inadequacy of our present symbols. Whereas we have but 23 symbols (c, x, and q are supernumerary), there are from 38 to 44 sounds to be represented. Even in the use of our few symbols there is much inconsistency. Especially is this true with regard to the vowels. Taking an example at random, we see, for instance, the short e sound represented not only by e as in *set, fed, nettle*, but by a as in *many*; by ea as in *feather, leather*; by ai as in *said and against*; by ei as in *heifer*; by eo as in *jeopardy and leopard*; by ay as in *says*. In the present cent., however, a movement has arisen for a reform in this direction, although with little headway even in America. See also SIMPLIFIED SPELLING.

**Orthopaedic Surgery** (Gk *orthos*, straight; *paia*, child), branch of surgery concerned with bones, joints, muscles, nerves, and any tissues so injured or diseased that deformity or impairment of function may



result; its applications are by no means confined to children. The main types of affections treated in O. S. are: (1) Affections of joints. These affections may be due to bacterial infection or to injuries such as fractures, bad sprains, or repeated minor injuries. (2) Affections of bone may similarly be due to infection or to injury such as fracture (q.v.). The growth of bone may also be affected by certain disturbances of the endocrine secretions, by deficiency of antirachitic vitamins (see RICKETS), and by tumours. (3) Diseases or contraction of the soft tissues such as skin, muscle, and tendons near joints may cause deformity. Gradual stretching will correct some forms of contraction. Infected or injured bursae, the lubricating sacs over the joints, are other frequent causes of deformities such as bunions and housemaid's knee. (4) Affections of the nervous system include obstetric injury to this system, degeneration of nerve tracts, cerebral lesions, and infantile paralysis (q.v.). (5) Most deformities are 'static,' and mainly due to bad postures. Flatfoot (q.v.), round shoulder, and hollow back are some of the commonest static deformities. (6) Congenital affections result from abnormal embryological development, and their causes are not fully known. Congenital clubfoot, flatfoot, dislocation of hip, affections of the vertebral column, are amongst other congenital faults treated by O. S. Physiotherapy (q.v.) is one of the main aids to O. S. See J. Cyriax, *Textbook of Orthopaedic Medicine*, 1954.

**Orthophosphoric Acid**, see PHOSPHORUS.

**Orthoptera** (Gk *orthos*, straight; *pteron*, wing), large order of insects containing over 12,000 species among which are such well-known creatures as grasshoppers, crickets, cockroaches, leaf- and stick-insects. They are characterised by their conspicuous and biting mouth-parts, stiff tegmina, and membranous metathoracic wings, which close like a fan when in repose; the wings are frequently either reduced or absent, and there is no abrupt metamorphosis.

**Orthoptics**, see REFRACTION, ERRORS OF, *Sight-testing and under SQUINTING*.

**Ortho-Sulphobenzimide**, see SACCHARIN.

**Ortler Group**, N. Italy, group of the E. Alps (q.v.), forming the watershed of the Adige, Adda (qq.v.), and Oglio R. basins. The Ortler, or Ortler Spitze, 12,802 ft, the highest summit in the group, is near Bormio (q.v.). It was once regarded as inaccessible, but in 1804 it was ascended by Josef Pichler, an Austrian chamols hunter, with 2 Tyrolean mountaineers. The discovery of easier routes in 1865 caused the ascent to become popular.

**Ortolan** (*Emberiza hortulana*), member of the bunting family, common in Europe and W. Asia, but a rare visitant to Britain. It spends the winter in Africa, and is netted in great numbers while migrating. It rapidly fattens after being fed for a short time on oats, millet, and other grain, and is then killed for the table, being highly valued by epicures. The O. somewhat resembles another bunting, the yellow-hammer, but its head is grey. The

upper surface is reddish-brown with black streaks, the throat yellow, and the under parts greenish-olive. The nest is made on the ground or on banks, and in it are laid about 5 eggs.

**Orton, Arthur**, see TICHBORNE CASE.

**Ortona a Mare**, It. tn in Abruzzo e Molise (q.v.), 12 m. E. of Chieti (q.v.), on a cape on the Adriatic coast. Together with Lanciano (q.v.) it forms an archbishopric, and has many old buildings. The cathedral, castle, and Farnese (q.v.) palace were badly damaged during the Second World War. The small harbour is used for fishing and a coasting trade. Pop. 21,700.

**Ortygia**, see SYRACUSE.

**Oruro**, city of Bolivia, cap. of the dept of the same name. The dept has an area of 20,386 sq. m. and an estimated pop. of 210,260 (1950). The tn is the seat of a bishopric and the H.Q. of a military dist. It is the hub of the Bolivian railway system and the centre of a great tin-mining area. Silver, copper, and wolfram are also worked in the dist. The city stands at an altitude of 12,100 ft and the nights are very cold. There is a large power station. The pop. is 62,975, largely Indians, and their carnival masquerade ('Diabladus') is exciting and colourful and famous throughout the country.

**Orvieto**, It. city in Umbria (q.v.), 22 m. NW. of Terni (q.v.). It is situated on the r. b. of the Paglia, on an isolated, high plateau of tufa. It has Etruscan (see ETRURIA) antiquities, and is thought to be the site of the Etruscan tn *Volturni*, destroyed by the Romans c. 265 bc. It has been the seat of a bishop since AD 509. The beautiful It. Gothic cathedral (13th-16th cents.), partly constructed of grey and white marbles, has a magnificent façade with mosaics, bas-reliefs, and bronze sculptures. There is a palace (13th-14th cents.) formerly used by the popes, a splendid 13th-cent. *Palazzo del Popolo*, and many other remarkable buildings. The white wine of the dist. is famous, and O. has also a trade in corn and silk. Pop. (tn) 24,400; (com.) 28,350. See BOLSENA.

**Orwell, George**, pseudonym of Eric Blair (1903-50), Brit. novelist and essayist, b. Motihari, Bengal. Educ. at Eton, from 1922 to 1927 he served with the Indian Imperial Police in Burma, and later he used this experience in *Burmese Days*, 1934. A period of poverty, during which he was successively tutor, teacher, and bookshop assistant, is described in *Down and Out in Paris and London*, 1933. In 1936 he fought in the Spanish Civil War, was wounded, and wrote about it in *Homage to Catalonia*, 1938. During the Second World War he worked for the B.B.C., and immediately after it pub. his finest book, *Animal Farm*, 1945, a satire on dictatorship. His pessimistic *Nineteen Eighty Four*, 1949, pictures the horrors of totalitarianism pursued to the limit. Earlier novels were *Keep the Aspidochelone Flying*, 1936, *The Road to Wigan Pier*, 1937, and *Coming Up for Air*, 1939. He also pub. some vols. of essays, including

*Inside the Whale*, 1940, and *Shooting an Elephant*, 1950. See study by J. Atkins, 1955.

**Orwell**, first known as the Gipping, riv. of England, in Suffolk. It has its source a few miles W. of Stowmarket, through which it passes, flowing also through Needham Market. Below Ipswich it forms the estuary known as the Stour. The riv. is navigable to Ipswich.



British Railways

THE STOUR ESTUARY AT PARKESTON QUAY, HARWICH

**Oryol**, see **ORÉL**.

**Oryx**, important genus of antelopes, of the subfamily Hippotraginae, containing 6 species, natives of Africa, Arabia, and Syria. Both sexes have long, annulated horns, and the female has 4 mammae. *O. leucoryx* (the leucoryx), *O. beatrix* (the Beatrix antelope), *O. gazella* (the gemsbok), and *O. beisa* (the beisa) are the 4 best-known species.

**Oryza**, genus of tall, marsh grasses, family Gramineae, of which *O. sativa*, rice (q.v.), is the most important species.

**Orzesko**, Elise, née Pawlowska (1842-1910), Polish writer, b. near Grodno, Lithuania. She deals mainly with 2 themes, the misery of the peasants and the desolation of the Jews in their ghettos. In *Meir Ezofowicz*, 1878, her best novel, she symbolises the 2 currents that exist in all these ghettos, assimilation and complete religious, cultural, and social separation. Other books: *Eti Makower*, 1875, on the relations between the Polish nobility and the Jews; *On the Niemen*, 1888, on the Polish aristocracy (of which she was a member); *On Lost Souls*, 1886, on country life in White Russia; and *Gloria Fictis*, 1910.

**Osage**, N. Amer. Indian tribe, the most important of the Siouan linguistic stock.

They were among the fiercest of the plains tribes. To-day they are citizens of Oklahoma, numbering about 3500.

**Osage**, riv. of U.S.A., formed S.E. of Rich Hill, W. Missouri, by junction of Marais des Cygnes and Little O. Rivs. It flows ENE., and bearing NE. enters the Missouri R., joining it on the r. b. 10 m. from Jefferson City. Length 494 m.

**Osage Orange** (*Machura pomifera*), hardy deciduous tree, native of N. America. It is usually spiny, and bears entire or serrated shiny leaves and small yellow or green flowers, which are followed by large golden fruits, filled with a foetid slime.

**Osaka**, second largest city of Japan, 15 m. from its seaport of Kobe, is situated on a large riv. on the S.E. coast of the is. of Honshu, in the most central and populous part of the empire. Before the Second World War it was the great emporium of trade and luxury. It had over 7000 factories and yards producing textiles, glass, metal goods, leather goods, ships, etc., and exported, chiefly to Korea and China, large quantities of sugar, straw goods, and textiles. There is a fine castle. It suffered from a disastrous earthquake in 1891 and from fire in 1909. O. was much damaged by Amer. bombers in June-July 1945. Following a raid by super-fortresses, 1 June, some 400 super-fortresses bombed O. again on 7 June; again bombed 8, 14, and 19 June, the raid of 14 June being especially severe. Industrial targets S. of O. were hit on 3 July, and an oil refinery N. of it on 9 July. Then on 24 July some 700 super-fortresses bombed the tn, together with others (see further under PACIFIC CAMPAIGNS IN SECOND WORLD WAR). O. is again the commercial and industrial centre of the Kansai dist. Steel and other metals, machine tools, electric equipment, glass, textiles, and chemicals are important products. Pop. 2,547,000.

**Osbeckia**, genus of deciduous or evergreen herbs or shrubs (family Molastomaceae), bearing racemes of red, purple, violet, or yellow flowers, sometimes grown in warm greenhouses in Britain.

**Osborn**, Henry Fairfield (1857-1935), Amer. palaeontologist; b. Fairfield, Connecticut. In 1890 he became Da Costa prof. of zoology, Columbia Univ., and dean of faculty of pure science there, 1892-5. Curator of vertebrate palaeontology in Amer. Museum of Natural Hist., 1891-1910, he was later research prof. of zoology, Columbia Univ.; palaeontologist to the Canadian Geological Survey, 1900-1904, and to the U.S.A. Geological Survey after 1900. Celebrated for reconstruction of prehistoric mammals, his works include *From the Greeks to Darwin*, 1894, *Evolution of Mammalian Molar Teeth*, 1907, *The Age of Mammals*, 1910, *Men of the Old Stone Age*, 1915, *Origin and Evolution of Life*, 1917, *Impressions of Great Naturalists*, 1924, *Evolution and Religion in Education*, 1926, and *Man Rises to Parnassus*, 1927.

**Osborne**, Dorothy (1827-95), letter-writer, b. Chicksands, Beds, daughter of Sir Peter O., who held Castle Cornet in

Guernsey for the king during the Civil war. In 1655 she married Sir Wm Temple (q.v.), diplomat and essayist. Her letters to him during their long separation before marriage have a very great charm. The *Letters from Dorothy Osborne to Sir William Temple* were ed. by E. A. Parry in 1888 and by G. C. Moore-Smith in 1928. See Macaulay's essay on Temple, and Lord David Cecil, *Two Quiet Lives*, 1947.

**Osborne, John** (1929- ), actor and dramatist, b. London. Left school at the age of 17 and started work as a journalist, but gave this up after a few months in order to become an actor. Since then he has played in repertory theatres and touring companies throughout the country. His first play, *Epitaph for George Dillon*, was written in collaboration with Anthony Creighton. He wrote *Look Back in Anger* during one of sev. periods of unemployment; it was produced with great success by the English Stage Co. in 1956, after it had been rejected by most of the leading managements and agents. This was followed in 1957 by *The Entertainer*, in which Sir Laurence Olivier (q.v.) played the leading part.

**Osborne House**, formerly one of the favourite residences of Queen Victoria, in the Isle of Wight, 1 m. SE. of Cowes. Queen Victoria d. there in 1901, and the estate was willed to the Prince of Wales, who, on his coronation as Edward VII in 1902, made a gift of the building and grounds to the nation, to be used as a convalescent home for officers of the army and navy. It is now open to the public during certain months of the year.

**Osborne Judgment**, trade union action brought in the king's bench div., taken to the court of appeal and, finally, to the House of Lords (1909). The decision declared null and void a trade union rule which provided for an enforced levy on members towards the payment of the salaries of M.P.s, and thereby checked the growing political power of the unions. The judgment was largely nullified in the Trades Union Act of 1913.

**Osbourne, Lloyd** (1868-1947), Amer. novelist and collaborator with R. L. Stevenson, b. San Francisco, son of Samuel O. and Fanny van de Grift, his wife, whom Stevenson married in 1880. O. was educ. at private schools in Paris and elsewhere, and at Edinburgh Univ., where he studied engineering. Thereafter he was nearly always with the Stevensons. O. collaborated with his stepfather in writing *The Wrong Box*, 1889, *The Wrecker*, 1892, and *The Ebb-Tide*, 1894. Collaboration with so famous an author has tended to obscure O.'s individual merits and indeed O. was only 26 when Stevenson died. O. alone invented and wrote *The Wrong Box*, which Stevenson only touched up after its completion. The earlier part of *The Wrecker* was entirely O.'s work, but Stevenson invented the character James Pinkerton and wrote the last 4 chapters, besides more than 4 others (including the Paris scene), or about one-third of the book. *The Ebb-Tide* was jointly planned

and written throughout in intimate collaboration, but Stevenson completed the story, and rewrote most of it. O., however, was himself a first-rate storyteller, and he knew well the S. Seas which are the background of much of his work. With his sister, Mrs Strong, he wrote *Memories of Vailima*, 1903, on life in Samoa; in collaboration with his nephew, Austin Strong, he wrote 2 plays entitled *The Little Father of the Wilderness*, 1905, and *The Exile*, which was produced by Sir John Martin-Harvey. In 1887 he was U.S. vice-consul for Samoa, where he resided with Stevenson till the latter's death in 1894. He left Samoa in 1897, with his mother, and eventually made his home in the U.S.A. His separate publs. include *Love the Fiddler*, 1903, *The Motormaniacs*, 1906, *Three Speeds Forward*, 1907, *The Adventurer*, 1907, *Harm's Way*, 1909, *The Kingdoms of the World*, 1911, *Wild Justice*, 1922, *An Intimate Portrait of R. L. S.*, 1924, *The Girsom Mystery*, 1928, *Peril*, 1929, and contributions to many magazines.

**Oscas**, see **HUESCA**.

**Oscans** (*Oscas lingua* was the Lat. term for their speech), or *Osci*, in Gk *Oskoi*, or *Opikoi*, from *Opsci* or *Opici* (terms connected with the indigenous word *opos* or *opsaom*, in Latin *opus*, meaning work, to work), were Italic tribes who inhabited S. Italy in the first millennium BC. About 200 Oscan inscriptions are extant; 150 of them have been found in Campania. They belong mainly to the 3rd and 2nd cents. BC, but some inscriptions may be assigned to the 5th cent. BC, others to the Christian era. The most carefully engraved of them is the *Cippus Abellanus*, of the first half of the 2nd cent. BC, containing a treaty for the joint use of a temple by the inhab. of Nola and Abella. The longest is the *Tabula Bantina*, of the second half of the 2nd cent. BC, containing the local laws. The most important is the *Tabula Agnonensis*, of the mid 3rd cent. BC, containing a list of local divinities. There is an inscription from Messina (in Sicily), and a variety of short inscriptions come from Pompeii. Oscan coins have been found dating from the 5th to the 1st cent. BC. The Oscan script was an offshoot of the Etruscan alphabet. The careful spelling and engraving of the inscriptions, the precise differentiation of sounds, the invention of the letter-sign *u* for *o*, which did not exist in Etruscan, and of *i* for an open *i*, indicate the development of script and language.

The O., till their ruin in the Hannibalic war, had a higher civilisation than the contemporary Romans, and very probably possessed a literature. Their language was one of the most important of the Italic dialects, belonging to the same linguistic branch as Latin. This branch can be subdivided into 2 groups, Italic proper (Oscan, Umbrian, Siculan, and some minor dialects, such as Paelignian, Volscian, Marrucinian, Sabino) and Latinian (Latin and Faliscan) (see **INDO-EUROPEAN LANGUAGES**). These 2 groups can be distinguished as P-group (Italic

proper) and Q-group (Latinian); one of the most remarkable characteristics of their divergency being the fact that in the former group the Indo-European guttural-velar sounds  $q^u$  and  $g^u$  are represented by  $p$  and  $b$ , while in Latinian they are represented by  $qu$  and  $u$  (or  $gu$ , following  $n$ ); e.g. Lat. *quis* = Oscan *pis*; *uenerit* = *benust*. See further LATIN LANGUAGE AND LITERATURE.

**Oscar I** (1799-1859), King of Sweden and Norway, *b.* Paris, son of Jean-Baptiste Bernadotte, later Charles XIV (q.v.). Although proposals to reform the constitution proved abortive in his reign, much was done to promote the national welfare, especially in freedom for industry and trade, efficiency of communications, and reform of the criminal law. In 1857, owing to O.'s ill health, his son (afterwards Charles XV) became regent.

**Oscar II** (1829-1907), King of Sweden and Norway (of the latter until 1905), son of Oscar I, *b.* in Stockholm. In 1872 he succeeded his brother, Charles XV, as King of Norway and Sweden. When Norway separated from Sweden (1905) it is attributed to O.'s broad mindedness and insight that there were no serious popular uprisings (see HAAKON VII; NORWAY; SWEDEN). During his reign great strides were made in national development, scientific research, geographical discovery, and industrial enterprise. He wrote *Memorials of the Swedish Fleet* (poems); *Military History of Sweden, 1711-13*, 1861-7; a trans. of Herder's *Cid*; a poetical version of Goethe's *Torquato Tasso*, 1861; and *Memoirs of Charles XII* (Eng. trans., 1879).

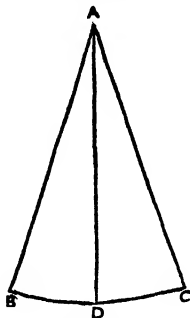
**Oseola** (Seminole, *As-se-ho-lar*) (c. 1800-38), chief of the tribe of Seminole Indians in Florida. In 1835 the Indians rose in rebellion against being transferred to reservations W. of the Mississippi R. Amer. troops were sent against them. In Dec. Maj. Dade and 100 soldiers were massacred in a Florida swamp, and on the same day O. killed and scalped Wiley Thompson, an Indian agent. For a long time O. and his men held out, and hundreds of Amer. soldiers perished of fever in the swamp. He was taken prisoner at last while holding a conference under a flag of truce, an act of inexcusable treachery, though represented as one of retaliation, and confined in Fort Moultrie until his death. Gen. Jessup, who captured O., was severely censured for his act, but he contended that it was the only way to stop the career of the treacherous chief. However, the war went on for about 7 years, costing the U.S.A. \$20,000,000 and the lives of 1500 men.

**Osoherleben**, Ger. tn in the dist. of Magdeburg, on the Rode, 19 m. WSW. of Magdeburg (q.v.). It has engineering, chemical, and foodstuff industries. Pop. 20,000.

**Osci**, see OSCANS.

**Oscillation.** A body is said to oscillate when it moves backwards and forwards like a pendulum. The verb to oscillate means to swing to and fro or to vibrate. The motion of a pendulum is the typical oscillatory motion. Suppose the bob is

displaced from D to B, and then released. It swings along the arc BC and then back along CB, and so on. It oscillates along BC about the equilibrium position D. BD is the amplitude of O. Suppose the bob is moving through D in the direction of BC. The time taken before the bob moves again through D in this same direction is called the period of O. For any given pendulum of constant length this period is always the same if the pendulum is not restrained and the arc of O. is small. This period is termed the



OSCILLATION

natural period of O., and is defined as the period of a body which is set oscillating and left to itself. But a body may execute forced O. If it is acted on by an alternating force of definite period, it ultimately oscillates in a period coincident with that of the force and not with its own natural period. The centre of O. is the point of an oscillating body such that if the whole mass of the body were concentrated there, the time of O. would be unchanged. It coincides with the centre of percussion of the body. See also CENTRE OF OSCILLATION; HARMONIC MOTION; RESONANCE.

**Oscillators**, oscillation generators, devices producing sustained oscillations, usually combinations of a naturally oscillating unit with a device supplying energy to make good what is lost in friction or otherwise, as an electromagnet excited with a.c. of the correct frequency maintains the vibrations of a tuning-fork. Electric O. in radio engineering consist usually of an oscillatory circuit (q.v.) with an amplifier valve supplying its own input. The valve converts the d.c. power supplied to the anode into a.c. power, part of which is fed back to the grid. The grid-cathode voltage is opposite in phase to the anode-cathode voltage. A grid-leak bias GL (fig. 1) improves the stability and makes the oscillator self-starting. Figs. 1 and 2 show two conventional O. The frequency is approximately the resonance frequency of the

oscillatory circuit,  $\frac{1}{2\pi\sqrt{LC}}$ , but depends somewhat on the electrode voltages and

the coupling of the load. Variations in frequency occur owing to changes in  $L$  and  $C$  with varying temp. and to temp. effects in the valve, as well as to variations in load impedance. The latter can be eliminated by use of a buffer amplifier. A high  $Q$ -factor (q.v.) of the  $LC$  circuit makes the frequency independent of valve voltage and load. A high degree of stability can be obtained by using a

tude of the oscillations increases to a maximum at a frequency just below the resonance frequency of the  $LC$  circuit. At ultra-high frequencies the  $LC$  circuit is replaced by parallel-wire or coaxial transmission lines (see RESONANCE). Such lines have distributed capacitance and inductance—they are miniature models of power transmission lines. A line 7.5 cm. long corresponds to a quarter-

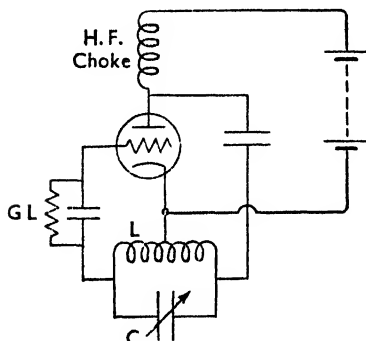


FIG. 1. HARTLEY OSCILLATOR

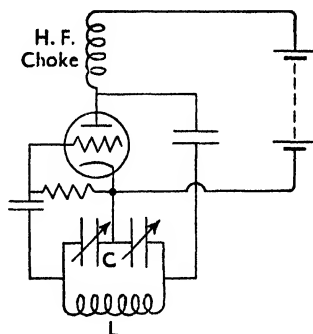


FIG. 2. COLPITTS OSCILLATOR

mechanically vibrating quartz crystal as control. A quartz plate with the flat sides perpendicular to an electric or  $X$ -axis—an 'X-cut'—is placed between two electrodes across which an a.c. voltage is applied. This excites mechanical vibrations of the quartz plate with a very sharp maximum at the resonance frequency. (Conversely a forced mechanical vibration produces an a.c. voltage across the faces—examples of the piezo-electric effect.) As the quartz plate acts like an oscillatory circuit, the resonance frequency can be adjusted by shunting with a capacitor. The crystal oscillator is used on fre-

wavelength at 1000 Mc/s. For frequencies of 3000 to 30,000 Mc/s the ordinary valve is not suitable, especially at power sizes, as various parasitic oscillations arise owing to inductance of leads, stray capacitances, etc. In the reflex klystron and the klystron, the velocities of the electrons emitted from the cathode are modulated, and in the magnetron the trajectories of the electrons are affected by the simultaneous actions of a magnetic and an electric field. In both cases the result is that electrons are collected together ('bunched') in a mass or a cloud and supply energy at the proper fre-

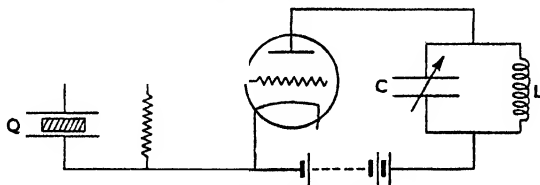


FIG. 3. QUARTZ-CRYSTAL OSCILLATOR

quencies from 4 kc/s to 10 Mc/s. Stability of 1 part in 10,000 can be maintained indefinitely, and the crystal oscillator is the standard device for maintaining the frequency of transmitting stations.

The  $LC$  circuit is tuned to a frequency slightly less than the resonance frequency of the crystal; the oscillations are generated at a frequency independent of the valve. If  $C$  is now increased, the ampli-

quency to cavity resonators (q.v.). Magnetrons are the only devices suitable for high power output (1-100 kW) at wavelengths of the order of cms. See F. E. Terman, *Radio Engineering*, 1947.

**Oscillatory Circuit**, electric circuit with capacitance and inductance, in which energy surges between the electrostatic and the electromagnetic form, as the energy of a swinging pendulum surges

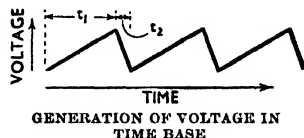
between potential at the top of the swing and kinetic at the bottom. The energy stored in a capacitor of capacitance  $C$  charged to  $e$  volts is  $\frac{1}{2}Ce^2$ , and when the capacitor discharges through an inductance  $L$ , the current  $i$  builds up electro-magnetic energy  $\frac{1}{2}Li^2$ . As in the swinging pendulum, the energy flows back, charging the capacitor again, and the process continues with decreasing amplitude until the energy is dissipated as heat in the resistance  $R$ —always present in electric circuits. The frequency of the

oscillations is  $f = \frac{1}{2\pi} \sqrt{\frac{1}{LC} - \frac{R^2}{4L^2}}$ . This is the 'natural frequency' of the circuit. If  $R > 2\sqrt{L/C}$ ,  $f$  becomes imaginary: the capacitor discharges without oscillations, the energy is very quickly lost in the resistance. If  $R$  is negligible compared with  $\sqrt{L/C}$ , and  $E$  and  $I$  are the maximum values of  $e$  and  $i$ ,  $\frac{1}{2}CE^2 = \frac{1}{2}LI^2$  and  $E/I = \sqrt{L/C}$ . This is the 'surge impedance' of the circuit. When  $R$ ,  $L$ , and  $C$  are connected in series across an a.c. supply at constant voltage with adjustable frequency, at low frequencies the capacitive reactance,  $1/2\pi fC$ , is greater than the inductive reactance,  $2\pi fL$ , and the current is leading. As the frequency increases, the phase angle decreases and

becomes 0 at  $f = \frac{1}{2\pi\sqrt{LC}}$  when the reactance vanishes and the current becomes a maximum, limited by  $R$  only. This is the 'resonance' (q.v.) frequency of the circuit. At higher frequencies the current becomes lagging. If an inductive ( $R_L$ ,  $L_L$ ) and a capacitive circuit ( $R_C$ ,  $C_C$ ) are connected in parallel across the a.c. supply, the main current—the vector sum of the 2 branch currents—is lagging at low frequencies, the phase angle becomes 0 at resonance, when the current is a minimum, and at higher frequencies the current becomes leading. See CIRCUIT, ELECTRIC and RESONANCE, ELECTRIC.

**Oscillograph**, instrument used for the study of wave-form of electric current and voltage (or any phenomenon that can be translated into such) and for recording transient electric phenomena (q.v.). The electromagnetic O., invented by Duddell, is in principle a moving-coil galvanometer. Two phosphor bronze strips are stretched taut in the gap of a powerful electromagnet and carry a small mirror. The coil is immersed in castor oil which gives suitable damping, and has a period of free oscillation of 0.0001—0.0003 sec. A beam of light is focused on the mirror and reflected on to a second mirror, vibrating or rotating at right angles to the coil vibrations, which furnishes the time scale. For recording, a photographic film on a drum takes the place of the time scale. The deviation of the coil is about 3 cm. when supplied with a.c. of 0.2–0.5 A. For power frequencies, the Duddell O. is more accurate than the cathode-ray O. A hot-wire type is also in use. For use as O. the cathode-ray tube (q.v.) is provided with a time base. The

quantity whose variation is to be examined is 'translated' into a voltage which is applied to the horizontal plates so as to give vertical deflections of the spot. An a.c. voltage will then show a straight vertical line. To spread out this line into a wave and repeat the process so as to give a steady (locked) picture, the spot is given a horizontal motion to the right, with constant velocity, with a quick fly-back at the end of one complete cycle (or more). This is achieved by impressing on the plates a voltage of 'saw-tooth' wave-form (see FIG. 1). The time base is provided with controls, calibrated in frequencies, which enable the cycle to be varied from a few c/s up to sev. kc/s.



Amplifiers are usually built into the time-base apparatus. These amplifiers must possess a flat and uniform response up to the frequencies of a few Mc/s if they are to handle all types of wave-form without distortion. Provision is made in the O. to enable the wave-form under examination itself to 'trigger' the time base independent of the frequency controls of the latter.

The O. is one of the most useful tools of the engineer. Complicated wave-forms can be examined in detail, which is essential in radar (q.v.) and television (q.v.). It is applied to the measurement of vibrations in engines and other structures, to pressure variations, and to switchgear and other transients.

**Osh:** 1. Oblast (prov.) of the Kirgiz S.S.R. of the Soviet Union. Cotton is extensively cultivated in the Fergana valley and there are important coal-mines. Pop. 410,000.

2. Cap. of the O. oblast, has silk-spinning and textile mills. It is the starting point of the Pamirs motor-road to Khorog. Pop. 45,000.

**O'Shaughnessy**, Arthur William Edgar (1844–81), poet, b. London. He was for a time, from 1863, assistant in the natural hist. dept. of the Brit. Museum. In 1870 he pub. *An Epic of Women, and Other Poems*. This vol. met with great applause, but he was not so successful in his next venture, *Lays of France*, 1872, nor in his third, *Music and Moonlight*, 1874. His *Songs of a Worker*, ed. by A. W. N. Deacon, were pub. posthumously in 1881. See life by Louise C. Moulton, 1894.

**Oshawa**, industrial city of Ontario, Canada, on Lake Ontario, 30 m. E. of Toronto. It has a good harbour, and is on the main lines of both the Canadian National and Canadian Pacific Railways from Toronto to Montreal. It is the centre of a good agric. dist. The city has a fine collegiate-vocational institute, a

modern hospital, a good public library, 31 churches, and 4 parks. Its hydro-electric power is provincially owned and municipally operated. The most important industry is motor-car and truck manufacturing; other industries include motor accessories, castings, brass and copper fittings, plastics, pharmaceuticals, builders' supplies, sheet-metal materials, woodlens, pottery, and glass bottles. Pop. 46,051.

**Oshima**, group of 3 small is. belonging to Japan, lying S. of Kyushu, in 30° 50' N. lat. and 130° E. long. Their names are Kuroshima, Iwojima, and Takashima.

**Oshkosh**, city, co. seat of Winnebago co., Wisconsin, U.S.A., in resort area on the W. shore of Lake Winnebago where it receives the Fox R., 75 m. NNW. of Milwaukee. O. manufs. woodwork, machinery, and automobile parts, and has a W. state college. Pop. 41,100.

**Oslander**, Andreas (1498-1552), Ger. Protestant divine, b. Gunzenhausen, son of a blacksmith named Hoseman. He took an active part in the Reformation, and attended conferences at Marburg, Augsburg, and Schmalkald. While pastor in Nuremberg he pub. his *Harmony of the Gospels*, 1537. In 1548 he was appointed lecturer at the new univ. of Königsberg, but his religious opinions were unpopular, and he was attacked by Melancthon and other Lutherans. He founded a famous family: his son Lukas (1534-1604) was a court preacher; Andreas (1562-1617), son of Lukas, was chancellor at Tübingen; Johann Adam (1626-97) was preacher, prof., and chancellor at Tübingen; and his sons, O. and John, physician and philologist respectively. See life by W. Möller, 1870.

**Osiers**, trees or shrubs of the willow genus (*Salix*), cultivated for conversion into baskets and other wicker-work articles. They are grown in plantations known as holts, and the produce is commercially called rods. O. are usually grown on deep rich alluvial soil, which is subject to flooding. Sets of 2 years' growth, about 18 in. long, are planted in Feb. or Mar. at the rate of about 20,000 per ac. The land needs careful clearing for the first 2 years, and the holts mature after 3 years, lasting, if properly managed, 15 years. *Salix viminalis* is the common osier, with 40 varieties or hybrids. This is the species chiefly used in basket-making. Brit. osier-beds also contain *Salix triandra*, the Fr. willow, much hybridised; *Salix purpurea*—which does not attain the tree form, its slender twigs being grown as O. by pollarding the trunk; and the golden osier, a variety of white willow. See also BASKET.

**Osijek** (Ger. Esseg; Hungarian Eszék; anct. Mursa), tn in Croatia, Yugoslavia, on the Drava. Its site has been occupied since Neolithic times. It is the cultural and economic centre of Slavonia (q.v.), manufs. textiles and furniture, and is an agric. market of great importance. Pop. 57,300.

**Osimo** (anct. Auximum), It. tn, in the Marche (q.v.), 9 m. S. of Ancona (q.v.). It was a Rom. colony after 157 BC. There

are remains of anct. walls, and a cathedral, and the tn has a trade in agric. produce and silk. Pop. (com.) 23,000.

**Osipenko** (until 1939 Berdyansk), port on the Sea of Azov, in the Zaporozhye oblast of the Ukraine; it has an engineering industry (agric. machinery, aircraft), and is a mud and beach health resort. Pop. (1936) 59,000 (c. 1914, 38,000; 1926, 26,000). O. was founded in 1827, and became a tn in 1835.

**Osiris**, an Egyptian god estab. in the Delta about the 5th dynasty, always represented as a dead king with the Atef crown (q.v.), shrouded and holding crook and flail. His cult may be Syrian, a form of the god of vegetation who dies annually and comes to life again. The myth woven round him in Egypt—known chiefly from Ptutarch—mainly concerns his death and resurrection as ruler of the dead. His sister Nephthys was the counterpart of her brother-husband Set, who killed O. but was defeated by O.'s son Horus the younger (q.v.). Two versions of O.'s death are both connected with the Nile, chief source of vegetation in Egypt. In one he was entrapped by Set in a chest which was thrown into the Nile and carried to the Delta swamps. Isis (q.v.), his wife, eventually found it, mourned over it, and went to urge Horus to avenge his father. Meanwhile Set came and cut the body into 14 pieces, dispersing them over Egypt; Isis eventually found all but one, building a shrine over each part where she found it.

By the Middle Kingdom, the identification of the dead king with O. had been extended to commoners, so that every dead man was known as O. So-and-so. This O. cult spread rapidly. When it reached Upper Egypt the centre of the cult became Abydos, where the tomb of Zer, third king of the 1st dynasty, was identified as the tomb of O. In the Late Period, O. became the chief god, even superseding Amun-Ra as ruler of the world. (See also SERAPIS and DRAD, BOOK OF THE.)

**Osler**, Sir William (1849-1919), Canadian physician and humanist scholar, b. Bond Head, Ontario. He graduated M.D. at McGill Univ., 1872, and was prof. of the institutes of medicine there, 1874-1884; he then became prof. of clinical medicine at the univ. of Pennsylvania, 1884-9 and at the age of 40 he accepted the chair of medicine at Johns Hopkins Univ. in Baltimore, 1889-1904. Given the opportunity to establish a new medical school there, he created an institution that revolutionised medical teaching in N. America by his combination of bedside teaching and co-ordination of wards and laboratories. At the age of 56 he became regius prof. of medicine at Oxford. A versatile man, O. left the impress of an original mind on pathology, clinical and scientific medicine, and epidemiology. His famous *Principles and Practice of Medicine*, 1892 (16th ed., 1947), was the most popular text-book in the Eng. language with sev. generations of medical students and practitioners. Among O.'s most original and lasting

contributions to scientific medicine must be included his investigations of the blood-platelets, his researches on the malarial parasite, his studies in malignant endocarditis, and his writings on angina pectoris and allied disorders. Tuberculosis was also one of his special subjects. He was one of the first seriously to question the estab. use of alcohol in medical practice, and to point out that its regular use increased the danger of tuberculosis. O. was more than a great physician and scientist; he was a humanist and classical scholar, being the first member of his profession to be elected president of the Classical Association, and he was also president of the Bibliographical Society in 1913. He was an enthusiastic collector, especially of classical medical texts and of the writings of Sir Thomas Browne. He bequeathed his magnificent library of over 7500 items to McGill Univ., where, with its catalogue, the *Bibliotheca Osleriana*, 1929, it stands as a monument to one of the greatest and best-loved of all physicians. O. was an apostle of international medicine, and personified the truth of the saying that the art of healing knows no frontiers. Elected F.R.S. in 1898, he was created a baronet in 1911. Among his works are *Cerebral Palsies of Children*, 1889, *Chorea and Choreiform Affections*, 1894, *Lectures on Abdominal Tumours*, 1895, *On Angina Pectoris and Allied States*, 1897, *Monograph on Cancer of the Stomach*, 1900, *Science and Immortality*, 1904, *Aequanimitas and other Addresses*, 1904, *Counsels and Ideals*, 1905, *An Alabama Student and other Biographical Essays*, 1908, *The Principles and Practice of Medicine* (8th ed.), 1912, and *The Evolution of Modern Medicine*, 1913. He also ed. *A System of Medicine*, in 7 vols., 1905-1910. See H. Cushing, *Life of Sir W. Osler*, 2 vols., 1926, 1940; E. G. Reid, *The Great Physician*, 1931; W. R. Belt, *Osler*, 1952.

**Oslo** (formerly *Christiania*), cap., city, and co. of Norway, situated in the S.E., at the head of the O. Fjord.

O. was founded in the 11th cent. by King Harald Haardraade. In 1624 it was completely burnt down and replanned by Christian IV (hence the name *Christiania*). He was a Dan. monarch, and following Norway's separation from Denmark, 1814, and from Sweden, 1905, the city reverted in 1925 to its original Norwegian name, O. O. fell to the Germans in the Second World War on 9 April 1940, the city having been taken by surprise by sea and air forces. The Germans surrendered to the patriots in May 1945, and O. was liberated.

Since the incorporation of the neighbouring dist. of Aker on 1 Jan. 1948, O. has become one of the largest cities in the world territorially, with an area of 453.3 sq. km., mostly rural. Urb. O. is rapidly expanding, however, with many new housing estates growing up around it. The city, with the fjord stretching out to the S., is very beautifully situated among pine woods and hills that rise like an amphitheatre. The sheltered harbour is excellent, and has ample facilities to

accommodate the largest ships. During severe winters the fjord may be frozen, but is kept open by breakers. There are 2 main railway stations with a good train service to all parts of Norway, into Sweden and the Continent via Denmark. Electric trains connect the city and the suburbs; the roads are good and the easy travelling has made O. centre of extensive tourist traffic. The civil airport is Fornebu, 20 min. by road from the city centre. Many of the prin. buildings are conveniently concentrated in or near the main street, Karl Johan, which is overlooked at one end by the Royal Palace (completed 1848). In Karl Johan are the National Theatre (closely associated with Ibsen), the older part of O. Univ. (completed 1854), and the Storting (Parliament). Close by and overlooking the fjord is the impressive tn hall (opened 1951 at the time of O.'s 900th anniversary celebrations). Architecturally the city is mostly a mixture of 19th- and 20th-cent. buildings. Of the latter, Broadcasting House is one of the finest examples. Of old buildings, the most outstanding is Akershus Castle, a fort and palace of medieval origins, overlooking the harbour and fjord. O. Cathedral in the main market square is a fine example of 17th-cent. church architecture.

O. is noted for its lavish municipal patronage of the arts. All the public rooms in the tn hall are richly decorated with large murals, executed by Norway's leading contemporary artists, and there is also much sculpture, including a series of colourful wooden reliefs from old Norse mythology. In Frogner Park (10 min. by tram from the city centre) is the unique collection of statues, comprising 150 groups by the Norwegian Adolf Gustaf Vigeland (q.v.), depicting the moods of man and woman in their journey from birth to death. The handsome Vigeland studio and museum (he d. in 1943) is close to the park. The collection of paintings by the expressionist Edvard Munch in the city's National Gallery is also important. O. is rich in museums, particularly in the dist. of Bygdøy (reached by ferry or bus in 10 min.). The Viking Museum there contains 3 original Viking ships and many other Viking relics. The buildings containing the Kon Tiki raft and the famous polar ship *Fram* are near by, and also the Technical Museum and Maritime Museum. Particularly popular is the Open-Air Folk Museum with its collection of 150 old wooden buildings assembled from many regions of Norway, and with original furnishings.

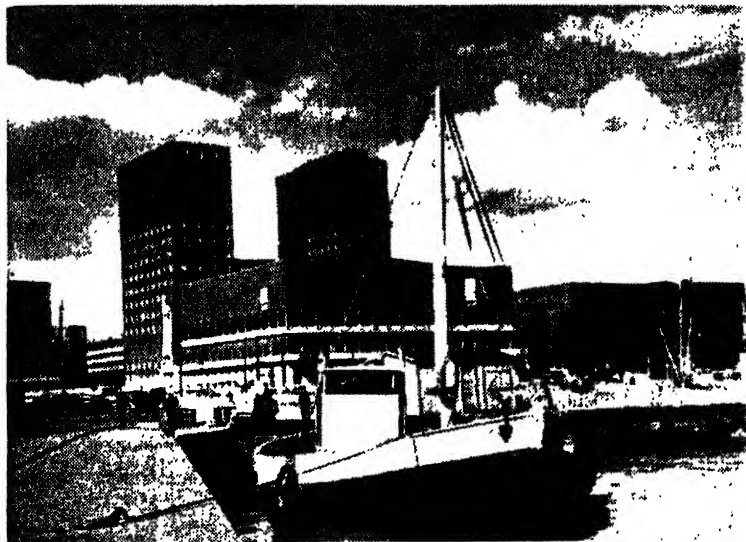
O. offers many opportunities for sport and open-air activity, especially skiing. Large tracts of forest land in the surrounding hills are accessible in 20 min. by electric train from the underground station in the city centre, and tens of thousands of O.'s inhab. spend winter Sundays skiing there. Holmenkollen is the site of the famous ski jump used only once annually, in Mar., for the international ski jumping competition which attracts up to 100,000 spectators. Facilities for bathing are good in the O. Fjord.



and one of Europe's finest swimming pools was opened in Frogner Park in 1956. Bislet Stadium is the centre for athletics and speed skating, and the new Jordal Amfi is used for ice hockey. O. is well provided with theatres and cinemas, whilst the hotels are good but insufficient for the large and growing number of visitors.

Formerly timber was the city's principal industry. Now, however, the economy is much more varied, with a very considerable manufacture of both consumer and capital goods. O. is Norway's biggest

a small tribe of Ogüzian Turks. O. succeeded his father as chieftain in 1288, and on the destruction of the sultanate of Iconium in 1299 by the Mongols succeeded in obtaining part of Bithynia. He had previously subjugated many of the neighbouring Ogüzian chiefs, and this new accession of territory rendered him powerful enough to attack the Byzantines with success. In 1301 he defeated the Emperor Andronicus II at Baphaeon, and he continued his career of conquest until his death. O. had assumed the title of sultan on the extinction of the Iconium



Royal Norwegian Embassy

OSLO: CITY HALL

port both in volume of trade and also as port of registration for merchant shipping. Pop. 450,000.

Oslo Convention of Dec. 1930 was for a greater measure of free trade between the signatories, namely, the Netherlands, Belgium, Sweden, Norway, Denmark, and Luxembourg. Finland adhered in Feb. 1933.

Osman, or Othmān ibn 'Affān (c. 574–656), 3rd caliph of the Muslims. One of the early converts to Islam, he was one of its most zealous supporters, and linked himself still more strongly to Mohammed by becoming his son-in-law and private secretary. He was elected to succeed Omar in the caliphate in 644, but proved quite incapable. He was murdered by Mohammed, a son of Abu-Bekr.

Osman I, or Othman, Othoman (1259–1326), surnamed Al-ghazi (the conqueror), b. Bithynia, the son of Orthogrul, chief of

sultanate in 1299, and was the founder of the Ottoman dynasty.

Osman II (1605–22), Sultan of Turkey, son of Ahmed I. He succeeded to the throne in 1618 on his brother, Mustapha I, being declared insane, but he reigned for only 4 years, being dethroned by the janizaries and put to death.

Osmanthus, genus of evergreen shrubs and trees (family Oleaceae). The flowers of *O. fragrans*, sometimes grown in green-houses, are used in China to scent tea. *O. ilicifolius* and *O. delavayi* are very handsome hedge plants.

Osmiridium, or Iridosmine, alloy of osmium and iridium. It commonly occurs associated with platinum, palladium, copper, gold, and iron in the so-called platinum ores, found usually in outcrops of detritus deposits. The chief supplies of platinum ore are obtained from Russia, Colombia, Brazil, California,

and Australia. Of these, the Australian deposits are richer in O. in proportion to the platinum, and deposits have been found in Tasmania, where the O. is associated with iron. O. is used as a source of the 2 metals osmium (q.v.) and iridium (q.v.).

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**Osseswabrandwag** (Ox-wagon Sentinel), an organisation, secret in its method of operation and membership, now (1956) apparently negligible, formed by and among Afrikaners with the avowed purpose of maintaining the Afrikaans language as a means of keeping alive Afrikaans culture and thus stimulating nationalism and republicanism. It derives some of its influence from the inspiration that drove the Voortrekkers to uproot themselves from their ancestral homes (c. 1830) and go N. out of reach of Brit. domination. Its militant activities and pressure groups threatened to become a serious embarrassment to the National Party, and whilst in office two successive Afrikaans Prime Ministers, Hertzog and Malan, condemned their disruptive and quasi-treasonous activities, while the late Prime Minister, Strijdom (1893-1958), publicly expressed the same views.

**Ossiacher, Lake**, *see* CARINTHIA.  
**Ossian** (Fawn), latinised form of the Gaelic Oisín, a semi-mythical Gaelic bard who is claimed by both Scotland and Ireland, and the presumed author of a number of narrative poems dealing with the deeds of Finn MacCummhail and Cuchulain. About the middle of the 18th cent. James Macpherson (q.v.), a Scottish tutor, claimed to have discovered and trans. these poems, which had existed in the highlands from time immemorial in oral tradition. Doubts were cast on the genuineness of their source, Dr Johnson maintaining that they were an invention of Macpherson's, and a prolonged controversy ensued. It is now generally supposed that Macpherson composed a great part of these works, though he drew upon anc. sources. *See* T. W. Rolleston, *Myths and Legends of the Celtic Race*, 1911, and G. F. Black, *Macpherson's Ossian and the Ossianic Controversy*, 1926.

**Ossietsky**, Carl von (1889-1938), Ger. pacifist and journalist, b. Hamburg. He served in the regular army in the First World War and afterwards went to Berlin in the hope of founding a popular front against war. He became (1928) editor of *Die Weltbühne*, a paper of advanced pacifist opinion. In 1929 one of his contributors accused the Reichswehr of secretly rearming in defiance of the Versailles Treaty and O., with his contributor, was sentenced to 18 months' imprisonment. In 1931-2 he was imprisoned on an alleged charge that he had revealed military secrets; after being released he was re-arrested when the Nazis came to power and charged with being an enemy to the state and was in prison, 1933-6. While in prison in a concentration camp he was awarded the Nobel prize for peace

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also W. Kolarz, *Russia and Her Colonies*, 1952.

**Ossett**, municipal bor. in W. Riding of Yorks, England, 2½ m. W. of Wakefield. It has coal-mines, engineering works, and cloth mills, and is the centre of an area engaged in the reclamation of wool, and the preparation of mungo, merino, etc. At S. O. there are mineral springs. Pop. 14,600.

**Ossewabrandwag** (Ox-wagon Sentinel), an organisation, secret in its method of operation and membership, now (1956) apparently negligible, formed by and among Afrikaners with the avowed purpose of maintaining the Afrikaans language as a means of keeping alive Afrikaans culture and thus stimulating nationalism and republicanism. It derives some of its influence from the inspiration that drove the Voortrekkers to uproot themselves from their ancestral homes (c. 1830) and go N. out of reach of Brit. domination. Its militant activities and pressure groups threatened to become a serious embarrassment to the National Party, and whilst in office two successive Afrikaans Prime Ministers, Hertzog and Malan, condemned their disruptive and quasi-treasonous activities, while the late Prime Minister, Strijdom (1893-1958), publicly expressed the same views.

**Ossiacher, Lake**, *see* CARINTHIA.

**Ossian** (Fawn), latinised form of the Gaelic Oisín, a semi-mythical Gaelic bard who is claimed by both Scotland and Ireland, and the presumed author of a number of narrative poems dealing with the deeds of Fionn MacCumhail and Cuchulain. About the middle of the 18th cent. James Macpherson (q.v.), a Scottish tutor, claimed to have discovered and trans. these poems, which had existed in the highlands from time immemorial in oral tradition. Doubts were cast on the genuineness of their source, Dr Johnson maintaining that they were an invention of Macpherson's, and a prolonged controversy ensued. It is now generally supposed that Macpherson composed a great part of these works, though he drew upon anc. sources. *See* T. W. Rolleston, *Myths and Legends of the Celtic Race*, 1911, and G. F. Black, *Macpherson's Ossian and the Ossianic Controversy*, 1926.

**Ossietsky**, Carl von (1889-1938), Ger. pacifist and journalist, b. Hamburg. He served in the regular army in the First World War and afterwards went to Berlin in the hope of founding a popular front against war. He became (1928) editor of *Die Weltbühne*, a paper of advanced pacifist opinion. In 1929 one of his contributors accused the Reichswehr of secretly rearming in defiance of the Versailles Treaty and O., with his contributor, was sentenced to 18 months' imprisonment. In 1931-2 he was imprisoned on an alleged charge that he had revealed military secrets; after being released he was re-arrested when the Nazis came to power and charged with being an enemy to the state and was in prison, 1933-6. While in prison in a concentration camp he was awarded the Nobel prize for peace

for 1935. He d. of tuberculosis, which he had contracted through his maltreatment in the concentration camp at the hand of the Nazis.

**Ossification**, formation of bone (see BONE).

**Ossining**, tn in Westchester co., New York, U.S.A., on the E. bank of the Hudson R., 31 m. N. of New York. It was known as Sing Sing till 1901. The chief manufs. are chemicals and machinery, and there are iron foundries. It contains the state prison of Sing Sing. Pop. 16,098.

**Ossola Valleys**, see DOMODOSSOLA.

**Ossoli**, see FULLER, SARAH MARGARET.

**Ossory**, anct kingdom of Ireland in the SW. of Leinster. There are sees of that name, both of the Rom. Catholic and Protestant churches.

**Ostade**, *Adriaen van* (1610-85), Dutch painter, b. Haarlem, a fellow pupil of Brouwer under Frans Hals. His pictures consist of scenes from Dutch peasant life, and are conspicuous for their rich colouring and spirited touch. Among his pictures are 'The Alchemist,' in the National Gallery, 'The Fiddler,' 'Peasants in an Ale-house,' 'The Smoker,' 'A Village Tavern,' 'A Painter's Studio,' 'Peasants Dancing,' 'The Village School,' 'The Fish Market,' and 'A Village Fête.'

**Ostade**, *Isaack van* (1621-49), Dutch painter, b. Haarlem, was the brother and pupil of *Adriaen O.* Some of his works are 'A Village Inn,' 'Interior of a Dutch Peasant's Cottage,' 'Winter Landscape with Figures,' 'A Fish Auction' (Glasgow), 'Village Scene' (National Gallery), 'Frost Scene,' 'A Frozen River,' 'A Village Street,' 'A Frozen Canal in Holland,' and 'Travellers Halting at an Inn.'

**Ostberg**, *Ragnar* (1866-1945), Swedish architect, b. Stockholm, was educ. there, then studied abroad, returning 1900. His buildings in Stockholm include his masterpiece, the City Hall, 1911-23, the High School for Boys, and the Nautical Museum. Elsewhere he built the theatre at Umea, and extensions to Upsala Univ. He became prof. of architecture in Stockholm, 1921; and was awarded the R.I.B.A. Gold Medal in 1926.

**Osteitis**, inflammation of the bone (see CARIES). *O. deformans* (Paget's disease) is a chronic disease of uncertain cause in which bone tissue is absorbed and later replaced by excessive deposits of bone tissue under the periosteum (q.v.) and within the marrow cavity. These deposits calcify, and there is distortion and enlargement of the affected bones—mostly the skull, spine, pelvis, and tibia.

**Ostend** (Flem. *Oostende*; Fr. *Ostende*), city in the prov. of W. Flanders, Belgium, a fashionable seaside resort on the N. Sea, 77 m. WNW. of Brussels by rail. After Antwerp and Ghent it is one of the main ports of Belgium. It exports butter, fruit, vegetables, rabbits, oysters, and other foodstuffs, chiefly to England, is the H.Q. of the main body of the Belgian fishing fleet, and maintains a cross-channel service with Dover. The *digue*, or sea wall, constructed of solid granite, extends for 3 m. along the shore, and the piers (*estacades*) guard the harbour entrance.

There is a school of navigation, an important fish market, the summer palace of King Leopold I. presented to him by his aunt, Queen Victoria, in 1873, a casino which attracts many visitors, and parks. Its lighthouse was destroyed during the First World War, but has since been rebuilt. Though an old tn, fortified in 1583, with a stirring hist., most of the buildings are modern. In the First World War it was taken by the Germans in Sept. 1914, and became a naval base for Ger. submarines. A Brit. naval raid was made on 22-3 April 1918, and on 9-10 May the Brit. Navy, by sinking the *Vindictive*, partially closed the harbour. The tn was finally re-entered by the Allies in Oct. 1918. O. again suffered much from war in 1940, and was heavily damaged under Ger. occupation. Since 1945 considerable restoration has taken place. The people are engaged in the hotel trade, in fishing, shipbuilding, and manufs. of ropes, sails, nets, salt, and lace. Pop. (1955) 53,300.

**Osteolepida**, early crossopterygian fishes (q.v.) belonging to the suborder Rhipidistia. They occur in Old Red Sandstone and Carboniferous rocks.

**Osteology**, that part of anatomy which deals with bones and their uses. See BONE.

**Osteomyelitis**, inflammation of the medullary cavity, or 'marrow,' of a bone. The bone marrow, being highly vascular, is prone to infection by blood-borne organisms. Injury often appears to be a predisposing factor. O. is more common in children and young people whose bones are not yet fully grown. Since the septic inflammation of O. is hemmed in by bony walls, the resulting abscess is contained under tension and, as there is no ready outlet for the pus, there is considerable toxæmia and fever, with constitutional upset. There is death of surrounding cancellous bone (see CARIES) and sequestrum (q.v.) formation. Pus must be surgically drained, but antibiotics now hasten the cure of what used to be a lengthy and grave illness.

**Osteopathy**, complete science of healing based on the normalising of the body and its functions on the assumption that a structural derangement of skeletal parts (the 'osteopathic lesion') is the significant factor in all disease. By manipulation it endeavours to remove such abnormalities and thus re-establish the integrity of the body in its functional activities. The theory of O. was formulated by an Amer. doctor, Andrew Taylor Still, in 1874. O. must be distinguished from manipulative surgery as practised by orthopaedic surgeons (see under MANIPULATION) and 'bone setters.' The bone setter is a manipulator of joints. According to Still, all diseases are caused by obstruction of arteries or nerves by the pressure of maladjusted bones, especially of the vertebrae of the spinal column. In 1935, in a memorandum to a Bill before Parliament, O. was defined as 'a developing system of treatment of disease by manipulative methods.' There are now sev. osteopathic colleges in the U.S.A., the original being at Kirksville, Missouri.

The general offices of the Amer. Osteopathic Association are in Chicago. The Brit. School of O. was founded in London (16 Buckingham Gate, SW.1) in 1917. The practice is legalised in all the Amer. states, and in much of Canada. In Great Britain osteopaths have made repeated endeavours to obtain state recognition of their system. In 1931 an unsuccessful application was made by the Brit. Osteopaths Association for a royal charter. On 4 occasions—the last in 1935—parl. bills were introduced with the object of securing for osteopaths a status similar to that held by registered medical practitioners. All were unsuccessful. In 1946 the London College of O. was founded in Dorset Square, NW.1, with the object of teaching the theory and practice of O. to qualified medical men. The address of the General Council and Register of Osteopaths Ltd is 12 Clarges St, London, W.1. Pub.: the *Osteopaths Quarterly*. See G. Macdonald and W. Hargrave-Wilson, *The Osteopathic Lesson*, 1935; C. Hill and H. A. Clegg, *What is Osteopathy?* 1937; W. Haycock, *The Expanding Concept of Osteopathy*, 1956; R. W. Puttick, *Osteopathy*, 1956.

Oster Ringun, see ESTERGOOM.

Ostergötland, prov. of Sweden, containing sev. lakes, lying between Lake Vättern and the Baltic. There are iron and copper mines, and cheese is made. Chief tn. Norrköping. Area 4266 sq. m.; pop. 357,126.

Osterley, dist. in the bor. of Heston and Isleworth, Middx, England, about 10 m. from London, and lying across the Great W. Road. To its N. is O. Park (in the bor. of Southall), which contains a fine mansion built c. 1575 for Sir Thomas Gresham, founder of the Royal Exchange; it was decorated and remodelled by Robert Adam, c. 1761–80.

Osters, second largest of the Faeroe Is. (q.v.). Area 111 sq. m.; pop. 7000.

Osterode: 1. Ger. tn in the Land of Lower Saxony (q.v.), at the foot of the Harz Mts (q.v.), 52 m. SSE. of Hanover. It has textile manufs. Pop. 16,500.

2. See OSTRODA.

Osterreich, see AUSTRIA.

Ostfold, co. of Norway, with Sweden to the E. and SE., its W. coast being part of Oslo Fjord. It is primarily industrial, but there is also considerable agriculture. Area 1613 sq. m.; pop. 189,000.

Ostia, anc. port of Rome (q.v.), situated on the S. mouth of the Tiber (q.v.), 14 m. SW. of the city. According to Strabo it was founded by Ancus Marcius (q.v.). Claudius I (q.v.) built an improved harbour 2 m. NW. (*Portus Ostiensis*, or *Portus Augusti*), and another (*Portus Trajani*) was built by Trajan (q.v.). The prosperity of the tn derived from its salt works, but after the 4th cent. AD it declined. There was a temporary revival when the tn was fortified by Pope Gregory IV in the 9th cent., and another when Cardinal della Rovere (later Pope Julius II, q.v.) built a castle here in the 15th cent. The modern bathing resort of Lido di Roma is on the coast of the Tyrrhenian Sea, 2 m. SW. of O.

Ostiaks, see KHANTY.

Ostmark, name given to Austria by the Ger. Gov., after its incorporation into Germany in 1938 (see AUSTRIA, *History of Austria from 1918*).

Ostracism (Gk *ostrakon*, a potsherd), democratic measure introduced at Athens by Cleisthenes (c. 487), but not used after 417 BC. It was intended as a check upon any person who in any way whatever endangered the constitution, and the procedure was as follows. Each year the assembly voted to decide whether or not O. should take place. If the vote was in favour, each citizen then wrote the name of his intended victim on a potsherd; the ballot was secret, and anyone who was thus named on 6000 potsherds or more was banished for 10 (later 5) years, though without loss of property or civil rights. Only 10 persons are known to have been ostracised, and *ostraka* applying to each of them have been found. They include Miltiades, Themistocles, Cimon, and Alcibiades. See J. Carcopino, *L'Ostracisme athénien*, 1935.

Ostracoda, order of minute crustacea belonging to the subclass Entomostraca and consisting of about 2000 species. An ostracod usually leaves the egg as a nauplius, is of low and simple form, and uses only 3 or fewer appendages in mastication. The *Cypris*, belonging to the family Cypridae, is a common type of ostracod, having a bivalve enveloping shell resembling a mollusc, a body without segments, and 7 pairs of appendages.

Ostracoderms, ('shell-skinned'), primitive armoured jawless vertebrates without paired fins belonging to the class Agnatha (q.v.).

Ostrau, see OSTRAVA.

Ostrava (Ger. Ostrau): 1. Region (*kraj*) in central Czechoslovakia, bordering on Poland. It is part of the former prov. of Moravia (q.v.) and includes some dists. of Silesia (q.v.). The centre of the region lies in the basin of the Odra (see ODER), in the W. is the E. end of the Sudetic Mts (q.v.), and in the E. is part of the Carpathians (q.v.). Area 1746 sq. m.; pop. 790,500.

2. Moravská Ostrava (Moravian O.), Czechoslovak tn, cap. of the region of O., on the Ostravice near its confluence with the Odra. It stands in the 'Moravian Gap,' between the Sudetic and the Carpathian Mts, the classic military gateway from Vienna to Poland. During the Second World War it was taken by the Russians in April 1945 (see EASTERN FRONT). There are important coal, iron, steel, engineering, petroleum refining, and chemical industries. Pop. 181,000.

3. Slezská Ostrava (Silesian O.), Czechoslovak tn in the region of O., on the Ostravice opposite Moravská O., It has coal and engineering industries. Pop. 21,000.

Ostrich (*Struthio*), largest living bird, the male standing about 8 ft high. A native of Africa; but the name is sometimes given to the rhea, a native of S. America. The single species (*S. camelus*) forms the order Struthioniformes and is found in most parts of Africa S. of the

Sahara and in the Arabian and Syrian deserts. The bill is wide and flat, the small head has large eyes, while the long neck has a sparse covering of down feathers. The long legs have the lower parts of the 'thigh' naked and feet with two large toes bearing broad claws. The adult male's body is covered with black feathers, the plumes of the wings and tail grey white; females and young males have grey feathers. The male is polygamous and incubates the eggs at night, but the female may sit on them during the day.



Zoological Society of London

#### OSTRICH

The O. tends to occur in deserts and open plains, where it is found in small flocks. It runs at high speed (exceeding that of a horse) with the head outstretched and the wings spread. The food is mainly vegetable and the O. can go for a long time without water.

The O. has long been valued for its plumes, and the production of O. feathers is still a fairly important farming activity in S. Africa. For many years the birds were hunted and shot before their plumes were removed, and it is only comparatively recently that O.s have been domesticated. Young birds were first enclosed in S. Africa in 1857; yet in 1865 only 80 were in captivity. After 1870 greater attention was given to their domestication. The chief centre of the modern feather industry is at Outshoorn (q.v.); at the peak period (c. 1906-12) of O. farming there were some 400,000 O.s in this dist., but by 1939 there were under 20,000 birds.

A flock of O.s under modern systems of farming is given the free run of about 1000 ac. of veldt, where the birds pick up a good deal of rough food. In addition, lucerne or some other similar crop is grown at the rate of about 1 ac. for 3 birds. The birds usually pair in May or June, and a pair of birds breeds as often as 3 times a year; the hen lays an egg every other day, a sitting numbering from 12 to 20 eggs; and if they are removed, as many as 120 may be laid in the course of a year.

The O. chickens hatch out at the end of 6 weeks, and for the first 50 or 60 hrs are given no food, but allowed to bask in the sun. In the first 6 months of life their growth is very rapid. At 6 months the chick feathers are removed by clipping, and 2 months later the dead quills are pulled out. At 18 months they are full grown, though not fit to breed till twice that age. Usually it is the 3 rows of feathers at the tips of the wings and the tail feathers that are taken, the quill being cut about 2 in. from the socket. The quill stumps are removed 2 months later to allow a new crop of feathers to appear. An exceptionally good bird should yield from 20 to 26 oz. of feathers, and should give about 60 long whites and from 60 to 70 long blacks, in addition to the body feathers.

**Ostrich, South American, see RHEA.**

**Ostróda** (Ger. Osterode), tn of Poland, in Olstyn prov., on the Drweca, 20 m. WSW. of Olstyn (q.v.). It was formerly in E. Prussia (q.v.), and was badly damaged during the Second World War. There is a trade in timber and agric. produce. Pop. 10,000.

**Ostrog** (Ukrainian Ostroh), tn in the Rovno oblast of W. Ukraine, 120 m. NE. of L'vov. Known since 1100, O. in the 16th cent. was an important centre of Russian (Ukrainian) Orthodox culture (academy founded late 1570's, Church Slavonic Bible printed in 1581 by Ivan Fedorov, q.v.). Pop. (1931) 13,000.

**Ostrogoths, see GOTHs.**

**Ostrov Vrangelya** (Wrangel Island), is, in the Arctic Ocean off the NE. coast of Siberia. It was discovered in 1867 by an Amer. whaler, T. Long, although von Wrangel made an expedition in search of it. It consists mainly of bare rocks which rise to a height of 2500 ft in Mount Berry. Three meteorological stations are now maintained by the U.S.S.R., set up in 1926, 1946, and 1955.

**Ostrovskiy, Aleksandr Nikolayevich** (1823-86), Russian playwright, belonged to Gogol's school of Critical Realism. His plays dealt with the many ills of contemporary Russian society, particularly those of the merchant class. O. exercised a dominating influence on play-writing in Russia in the second half of the 19th cent., and is considered the real founder of Russian national drama-turgy. His plays are still very popular and many of their titles have become proverbs.

**Ostrowskia Magnifica**, hardy perennial plant (family Campanulaceae), a native of the Bokhara Mts. It sometimes exceeds 7 ft in height and bears huge campanulate blooms, lilac, blue, or pure white. It needs protection in winter.

**Ostrya**, genus of 4 deciduous trees, family Betulaceae. *O. carpinifolia*, Hop Hornbeam, of S. Europe and Asia Minor, and *O. virginiana*, Ironwood, of E. N. America, are cultivated for their ornamental qualities.

**Ostuni**, It. tn in Apulia (q.v.), 19 m. WNW. of Brindisi (q.v.). It has a 15th-cent. cathedral. Pop. (com.) 31,300.

**Ostwald, Wilhelm** (1853-1932), Ger.



chemist, b. Riga, Latvia. In 1887 he was appointed to the chair of chem. at Leipzig Univ., but retired from this position in 1906. He also held the position of director of the Electro-chemical Institute of Leipzig in 1898, and was the first exchange prof. at Harvard Univ. in 1905. In 1909 he was awarded the Nobel prize for chem. His process of forming nitrogen oxides by the oxidation of ammonia enabled Ger. manufs. of explosives in the First World War to be maintained despite the loss of Chilean nitrate imports. His numerous works embrace general chem., principles of natural science, energy, electro-chem., and monism; and works on Comte, Schopenhauer, etc. His autobiography, *Lebenslinien, eine Selbstbiographie*, was pub. 1926-7.

His son, Wolfgang (1883-1943), was b. Riga, from 1922 held the first chair of colloidal chem. at Leipzig, and became a leading authority on this subject.

Ostyako-Vogul'sk, see KHANTY-MAN-SIYSK.

Otyaka, see KHANTY.

O'Sullivan, Seumas, pseudonym of James Sullivan Starkey (1879-1958), poet, b. Dublin. In 1923 he founded the *Dublin Magazine*, which he ed. for the rest of his life. A mystical poet of the Celtic twilight school, he wrote *The Twilight People*, 1905, *Verses Sacred and Profane*, 1908, *The Earth-Lover*, 1909, *Poems*, 1912, *Requiem*, 1917, *The Lamplighter*, 1929, *Twenty-Five Lyrics*, 1933, *Personal Talk*, 1936, *Dublin Poems*, 1946, and *Translations and Transcriptions*, 1950. Collections of essays are *Impressions*, 1912, *Mud and Purple*, 1917, *Common Adventures*, 1926, and *The Rose and Bottle*, 1946.

Osuna (Rom. Gemina Urbanorum), Sp. tn in the prov. of Sevilla, with Iberian and Rom. remains, a Renaissance church, and some old mansions. There was once a univ. (1549-1820). It has a trade in osparto, olive-oil, fruit, and wine. Pop. 20,000.

Oswald, St (c. 605-41), King of Northumbria (634-41), and son of Ethelfrid of Bernicia. He defeated the Welsh king, Cadwallon, at Heavenfield (identified with St O.'s Cocklaw, near Chellerford, Northumberland), and thus fought his way to the throne. He had previously become a convert to the Christian faith at Iona, and with the help of St Aidan, on becoming King of Northumbria, estab. Christianity throughout the kingdom, founding the Lindisfarne bishopric. His festival is celebrated on 5 Aug. To commemorate his victory over Cadwallon, O. raised the first cross over the Christian altar in Bernicia. He was defeated in battle and killed by Penda, at a place then called Maserfield (probably Oswestry).

Oswald, St (d. 992), Eng. monk and Archbishop of York, said to be of Dan. descent. He was associated with St Dunstan and St Ethelwold in the revival of eccles. discipline and monastic life in England, himself founding the abbey of Ramsey and the monastery at Worcester, which later became the cathedral priory. He was made Bishop of Worcester in 961 and Archbishop of York in 972.

Oswaldtwistle, urb. dist. and tn of E. Lancs, England, 3 m. ESE. of Blackburn. It has cotton mills, collieries, stone quarries, and chemical works. Pottery is manuf. Sir H. Peel was born (1750) at Peelford in the township and James Hargreaves invented the spinning jenny here in 1764. Pop. 12,133.

Oswego, city and cap. of O. co., New York, U.S.A., on the SE. shore of Lake Ontario and 35 m. NW. of Syracuse. It has a good harbour and large shipments of grain, lumber, and coal. There are sev. iron foundries, machine shops, and oil works, and the manufs. include matches, engines, hosiery, starch, flour, textiles, etc. It is of historic interest because of its importance in Fr. and Indian wars. Pop. 22,647.

Oswego Tea, name applied to sev. species of *Monarda* plants, natives of N. America, by reason of the infused dried leaves being occasionally used as a beverage, given as a stomachic or in intermittent fevers. They are of the family Labiatae, and the particular species are the *M. purpurea*, *M. didyma*, and *M. Kalmiana*. *M. didyma* is one of the more attractive flowering plants native to E. N. America.

Oswell, William Cotton (1818-93), explorer, b. Leytonstone. He obtained an appointment in the E. India Co., and in India became an enthusiastic hunter of big game. Sent to S. Africa to recover his health, at Kuruman he was the guest of the famous missionary, Moffat, and his wife. In 1846, together with 2 Indian officers, he explored the Limpopo. Here he met with the kuababba or straight-horned rhinoceros, which he believed to be a separate species of the white rhinoceros. After another year in India O. returned to the Cape (1843), and joined the Livingstones at Kolobene (1849). With Livingstone and Mungo Murray he took part in the discovery of Lake Ngami, and in the exploration of the Kalahari desert. This notable expedition, by traversing wastes previously impassable to Europeans, succeeded in connecting the pastoral uplands, from which big game had been hunted, with the lakes and rivs. of the equatorial part of the continent. If he found the 'sand distressingly heavy and sun fiery hot,' he describes the scenery along the R. Zouga, the outlet of Ngami, as magnificent, with baobabs 75 ft in circumference. For his share in this expedition O. received a medal from the Paris Geographical Society, and the kebab rhinoceros was named after him. He also took part in the discovery of the Zambesi, which the party first came upon in Sebituane's country, where it was called the Seshéké (discovered 4 Aug. 1851). But notwithstanding O.'s eminent services to geography, and the loyal attitude of Livingstone towards him, his work soon passed into oblivion, the cause of this being his invincible laziness as a writer; indeed the earliest story of the expedition was learned through letters from Livingstone. See life by his son, W. Edward O., 1900.

Oswestry, tn of Shropshire, England, 20

m. NW. of Shrewsbury. The trade is chiefly agric., livestock marketing, tanning, insulated equipments, and printing, and there are railway workshops. It has Wednesday markets. There is an ancient grammar-school, founded in 1407, and the church originally belonged to a monastery, founded in memory of St Oswald, said to have been slain here in 641. O. was the original seat of the great family of FitzAlan from whom descended the earls of Arundel and the Stuart kings. Pop. 11,500.

was an outstanding champion of Christianity and a patron of learning and the Church.

*Osymandyas*, see RAMESES II.

*Osyris*, genus of evergreen shrubs (family Santalaceae). *O. alba*, the prin. species, bears racemes of small white flowers, followed by red berries. It is a native of S. Europe, and is half hardy in Britain.

Otago, prov. dist. of New Zealand. S. Is., situated to the S. of the prov. dists. Canterbury and Westland. It was one of



High Commissioner for New Zealand

CENTRAL OTAGO: LAKE WAKATIPU

The photograph shows Queenstown on Frankton Arm, and the Remarkables.

**Oświęcim** (Ger. Auschwitz), tn of Poland, in Katowice prov., near the mouth of the Sola R., 20 m. S. of Katowice (q.v.). There are coal-mines in the dist., and the tn has a power station. Pop. 7000. See AUSCHWITZ and CONCENTRATION CAMP.

**Oswy** (fl. 641-70), King of Northumbria. He succeeded to Bernicia on the death of his brother, St Oswald (q.v.). His early attempts to reunite Deira, now virtually a Mercian prov., and Bernicia failed. In 654 Penda (q.v.) determined to conquer O., and in a battle against overwhelming odds at an unidentified place called Winwaed in W. Yorks. Penda was killed (654). O. was now overlord of Mercia and S. England, but in 657 Mercia threw off his rule. For the rest of his reign he was simply King of Northumbria. O.

the 6 original divs. of the colony, which since 1876 have been abolished and the co. system adopted. It is divided into 2 areas: O. Portion and Southland Portion. The mts run from NW. to SE., the chief ranges being the Barrier Mts, the Kakanui Range, the Crown Mts, the Hector Mts, Richardson Mts, Eyre Mts, Aika Mts, Livingstone Mts, and Takitimu Mts. The chief rivs. occur on the E. coast, those on the W. being short torrential streams, and of the former the Clutha, which discharges the drainage from lakes Hawea, Wanaka, and Wakatipu, has the largest volume of any riv. in New Zealand. The Mataura drains the country to the S. of Lake Wakatipu, and the Waiatu R. discharges the waters of lakes Te Anau and Manapouri. The fiord-like lakes lie in long narrow valleys, and are famous for

their fine scenery; and of these the chief are Wakatipu, with a depth of 1239 ft. and Lake Manapouri, 1462 ft. deep. Among industries may be mentioned the rearing of livestock, arable agriculture, and mining, the prin. crops being wheat, oats, and barley, as well as all sorts of vegetables and fruits. In 1955 there were 42 cheese factories and 3 butter factories. O. has an important woollen-milling industry. Gold occurs in large quantities, and also coal, hewn stone, and slates. The cap. is Dunedin, which is picturesquely situated on the SW. side of O. harbour. It was founded in 1848 by members of the Free Church of Scotland, and owed its early prosperity to the gold-mining of O. It is the seat of Otago Univ., and the prin. school of mines. Area (O. Portion) 14,050 sq. m.; (Southland) 11,170 sq. m.; pop. (O. Portion) 168,935; (Southland) 81,000.

**Otaheite**, see TAHITI.

**Otariidae**, see FUR SEAL.

**Otaru**, seaport on the W. coast of Japan, off the is. of Hokkaido on Ishikari Bay, 90 m. N. of Hakodate. It has the most important fisheries of the is., and is especially a herring fishing centre. It manufs. agric. implements, vegetable oils, spirits, etc. Pop. 188,000.

**Otavallo**, tn. of N.E. Ecuador, on the railway, 90 m. from Quito and 16 m. from Ibarra. It is the centre of an agric. dist. in an Andean basin 8400 ft. above sea level. Its industries include wool, carpets, and ponchos. Pop. 9000.

**Otavi**, mining centre of SW. Africa, in Damaraland. Deposits of lead and copper are worked in the dist.

**Otea**, see GREAT BARRIER ISLAND.

**Otford**, vil. of Kent, England, 2½ m. N. of Sevenoaks. It has traces of a Rom. villa, and was the scene of battles fought by Offa of Mercia and Canute. There are ruins of the palace built by Archbishop Warham in the early 16th cent., and a few Tudor houses in a good state of preservation. Pop. 2437.

**Otfried** (c. 300-70), religious poet, b. in Alsace. Having studied in the abbeys of St Gall and Fulda, where he had Rabanus Maurus (see RABANUS MAGNENTIUS MAURUS) for his master, he joined the Benedictine monks and entered the monastery at Weissenburg. He wrote *Liber Evangeliorum*, a political harmony of the gospels in Old High German, printed at Basel in 1571. O. is the oldest Ger. poet known to us by name. See study by D. A. McKenzie, 1946.

**Othere**, Othmore, or Ottar (fl. 890), 'the old sea-captain who came from Helligland,' Norse navigator and explorer of Alfred the Great's reign. He made 2 voyages between 880 and 900, in one of which he is said to have sailed round the N. Cape into the White Sea.

**Othmar**, St (Othmar, Audemar) (d. 759), was of Teutonic origin: in 720 he became abbot of the dilapidated monastery of St Gall. There he introduced the Benedictine rule, and made St Gall the most important abbey of Switzerland. He d. in prison after an unjust condemnation by an eccles. tribunal, after persecution

by 2 neighbouring counts. His feast is on 16 Nov.

**Otho**, Marcus Salvius (c. AD 31-69), Rom. emperor. In 58 he was sent by Nero to govern Lusitania, in order to separate him from his wife, Poppaea Sabina, whom Nero afterwards married. In 68 he supported Galba's rebellion against Nero, and when Galba became emperor accompanied him to Rome. He expected to be nominated as Galba's successor, but Galba preferred Piso, and O. formed a conspiracy. Galba and Piso were killed, and O. was proclaimed emperor on 15 Jan. 69. In Germany, however, Vitellius had been proclaimed likewise by his own troops; he marched on Italy and defeated O., who then killed himself (16 April 69).

**Otho** (Holy Rom. Emperors), see OTTO.

**Otho**, or Otto, of Freising (c. 1111-58), historian, son of Leopold, margrave of Austria. He was made bishop of Freising by his half-brother, Conrad III. His great work is a world hist., *Chronicon seu historia de duabus civitatibus*, in 7 books, coming down to 1146, which was continued by Blasius to 1210. He also wrote a hist. of the Emperor Frederick I. See C. Mierow, *The Two Cities* (Eng. trans. of Hofmeister's ed. of the *Chronicon*), 1928.

**Othonna**, genus of S. African trailing shrubs or herbaceous plants (family Compositae) with tuberous roots and yellow flowers. *O. capensis*, African ragwort, is a useful plant for hanging baskets or pots.

**Othonnopsis**, genus of shrubs (family Compositae), with decorative grey glaucous leaves and showy yellow flowers borne in late spring. *O. cheirifolia*, a low, evergreen shrub of N. Africa, is easily grown on a dry rocky or hot border, but needs protection in winter.

**Othrys**, or Heliovo, lofty mt range in S. Thessaly, Greece, shutting in the Thessalian plain on the S. It extends from Mt Tymphrestus, a summit of the Pindus Range (S.), E. through Phthiotis to the coast, separating the Peneus and the Spercheus. The summit Gerakovouni is about 5670 ft.

**Otiorrhynchus**, genus of weevils or plant-eating beetles. Many cause great damage to cultivated crops, both in the larval and beetle states. They can be destroyed by spreading pieces of sacking near infested plants and collecting them during the day-time while they seek shelter.

**Otis**, James (1725-83), Amer. statesman, b. Barnstable co., Massachusetts. He was a prominent member of the Massachusetts House of Representatives, and is especially famous for his speech of 1761 in support of the liberty of the colonies with regard to taxation. He was one of the organisers of delegates to the Stamp Act Congress of 1765. He pub. in 1782 *Indication of the Conduct of the House of Representatives of the Province of Massachusetts Bay*, in which he defended the Assembly for its rebuke of the governor for calling upon it to pay for protection against Fr. privateers which it had not sought, and *Rights of the British Colonies Asserted and Proved*, 1764, etc. See lives by W. Tudor, 1823;

F. Bowen, 1847; and F. W. Sprague, *Birthplace of the Patriot James Otis*, 1917.

**Otitis Media**, see EAR.

**Otley**, tn in the W. Riding of Yorks, England, 9½ m. NW. of Leeds, on the R. Wharfe. Near by is Farnley Hall, where Turner painted many of his pictures, and where there is a fine private collection of his works. There is a 17th-cent. grammar school, and the seat of the Fairfax family is at Denton Park near by. O. has an agric. trade and manufs. of leather goods and machinery, and in the vicinity are woollen and worsted mills. Pop. 11,330.

**Otocyon**, see DOG, *African Wild Dogs*.

**Otoliths**, or **Ear Stones**, are concretions, usually stony, which occur in the ears of fishes, and which are in contact with the sensory cushions supplied by the acoustic nerves. Their function is as an organ of balance, and they vary greatly in size, but are commonly minute. In the cod they are as big as the thumb-nail, and resemble porcelain in colour and texture. Frequently they are the only parts of a fish's anatomy which survive decay, and their variation affords a clue in many cases to species. Corresponding concretions occur in many invertebrates.

**Otoml**, Indian tribe of the Mexican plateau. They are probably a people of immense antiquity, dating from before the Toltec invasion, and were driven S. and partially subdued by the Aztecs or Nahuas. At the time of the conquest of Mexico they inhabited the mountainous dist. W. of the Mexican lakes. They number about 280,000, plus an equal number of mestizos, and are scattered through Guanajuato, Hidalgo, Querétaro, and Mexico states, N. and NW. of Mexico City.

**Otranto** (auct. Hydruntum), It. seaport in Apulia (q.v.), on the Strait of O. (q.v.), 22 m. SE. of Lecce (q.v.). In later Rom. times it succeeded Brundisium (see BRINDISI) as the chief It. port for Greece, and it retained its importance until its sack by the Turks in 1480. It has an archiepiscopal cathedral, and a ruined castle from which Horace Walpole (q.v.) took the title of his romance, *The Castle of Otranto*. There is a trade in fish and agric. produce. Pop. 3400.

**Otranto, Strait of**, strait, 45 m. wide, lying between the 'heel' of Italy and Albania, and joining the Adriatic Sea (q.v.) to the Ionian Sea (q.v.).

**Otsego**, lake in O. co., New York, U.S.A., 60 m. NW. of Albany. It is 8 m. long and 1 m. wide, and is the source of the Susquehanna R. It is the Glimmerglass of James Fenimore Cooper's tales.

**Otsu**, city of Shikagen. Japan, on Lake Biwa, 9 m. SE. of Kyoto. It was the auct. cap. and is now the seat of prefectural gov. Long noted for its silk and rayon manufs., it has also a large cotton industry, and produces sewing machines and engines. Pop. 107,000.

**Ottava Rima**, It. 8-line stanza of 10-syllable or 11-syllable lines used for chivalric romance and in mock-heroic poetry. There are other decasyllabic octaves, such as that used by Chaucer in *The Monk's Tale* and, later, by Spenser with or without that adoption of the

Alexandrine which converts it into the Spenserian stanza. The O. R. stanza with 6 heroic lines, rhyming alternately, followed by a couplet on a new rhyme (*abababcc*) was introduced into England by Sir Thomas Wyatt. The O. R. was used by many It. writers for romantic poems with a narrative basis and it was especially effective in mock-heroic verse (q.v.) as exemplified in that of Luigi Pulci, Ariosto, Francesco Berni (qq.v.), and others. It was occasionally used by Elizabethan poets, e.g. Drayton's heroic poem *Mortimeriados*, in rhyme-royal stanzas, and afterwards remodelled in O. R. as *The Barons' Wars*, 1603; but more often by translators such as Edward Fairfax, in his rendering of Tasso, and Sir John Harrington, in his version of Ariosto. It was also revived by translators in the 19th cent., e.g. by Wm Tennant who, in 1812, pub. *Ansler Fair*, a mock-heroic poem in O. R. full of fancy and humour; Wm Stewart Rose in his trans. of *Orlando Furioso*, 1823-31; and John Hookham Frere (q.v.) in *The Monks and the Giants* and *Arthur and the Round Table*, purporting to be by Wm and Robert Whistcraft. But its outstanding application to mock-heroic uses was by Byron, founding partly on Frere and partly on Ariosto and other Italians, and especially exemplified in *Don Juan*, *The Vision of Judgment*, and *Beppo*. It was also used for purely romantic poetry by Shelley in *The Witch of Atlas*, and Keats in *Isabella*; the latter showing the possibility of expressing tenderness and pathos in O. R. despite its inherently unsuitable structure for that purpose, while Shelley overcomes such difficulties by his unique gift of flowing melody. See Egerton Smith, *The Principles of English Metre*, 1923.

**Ottaviano**, It. tn in Campania (q.v.), 10 m. E. of Naples (q.v.). It is at the NE. foot of Vesuvius (q.v.), and has an auct. castle. Pop. 14,500.

**Ottawa**: 1. Episcopal city, port of entry, and cap. of the dominion of Canada, in Ontario, on the Riv. O., at its confluence with the Rideau, 101 m. W. of Montreal. O. is on both the Canadian National and Canadian Pacific main railway lines, and lies 220 m. NE. of Toronto and 110 m. W. of Montreal. It is a handsome city, picturesquely situated on a cluster of hills overlooking the O. Riv.; it is regularly laid out in rectangular blocks between the Chaudière and Rideau Falls, and is divided into two parts by the Rideau Canal. Much money has been spent in recent years in improving its parks, drive-ways, and general appearance. The chief buildings are the gov. buildings (1859-65) on Parliament Hill, the Rom. Catholic cathedral of Notre Dame, Christ Church Cathedral, Rideau Hall, the residence of the governor-general in the suburb of New Edinburgh, and the univ. The Gothic group of the Parliament Buildings dominates the city. Their central Peace Tower has a splendid carillon, and a noble memorial chamber to Canada's dead of the First World War. O. has a Ro.n. Catholic univ. (1849), normal school (primary teachers' training college), technical

school, collegiate institutes (senior high schools (q.v.)), public schools, free library, and a splendid park system. Besides its 2 cathedrals there are over 80 churches. It has fine residential dists. Here is held the ann. central Canada exhibition. The chief industry of the tn is lumbering. Thousands of men spend the winter in cutting down the timber, which is floated down to O. by the spring floods. The output of the O. lumber-mills is enormous. There are also manufs. of flour, iron goods, leather, and matches. The



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#### OTTAWA: THE CHÂTEAU LAURIER HOTEL

In the foreground are locks of the Rideau Canal.

Chaudière Falls (200 ft wide and 50 ft high), on the O. Riv. between O. and Hull, supply splendid water power to drive the factories situated along the banks of the riv. Within 50 m. of O. are installed hydro-electric plants, to a capacity of 1,023,500 h.p. The city is the social and educational centre of Canada and contains many museums, galleries, and educational institutions. The site of O. was discovered in 1613 by Champlain, who named the riv. that joins the O. here the Rideau. The city's origins date back to 1826, when a tn grew up around the H.Q. of the Brit. Army engineers who were building the Rideau Canal, which, with the chain of Rideau Lakes further S., affords navigation for small craft to Lake Ontario at Kingston, 90 m. S. The commanding officer of the engineers was Col. By, and

the settlement was first called Bytown. The tn was incorporated in 1854 and the name changed to Ottawa, after the great riv. on its N. side. In 1858 Queen Victoria chose it to be the cap. of Canada, at that time comprising only what are now the provs. of Quebec and Ontario. In 1867, on confederation, it was made the cap. of the dominion. It returns 2 members to the dominion House of Commons and 3 to the Ontario Legislature. Pop. 208,911, O. being the sixth city in size in Canada, following after Montreal, Toronto, Vancouver, Winnipeg, and Hamilton.

2. City, co. seat of La Salle co., Illinois, U.S.A., on Illinois and Fox Rs and Illinois Waterway, 40 m. SW. of Aurora, in a grain-growing, dairying, and coal-mining area. O. manufs. glass, clay products, radium dials, etc. Starved Rock State Park is near by. Pop. 17,000.

3. One of the largest rivs. of Canada, rises in lat. 48° 30' N., long. 76° W., on the watershed on the opposite side of which rise the St Maurice and Saguenay. After a course of over 700 m. it falls into the St Lawrence by 2 mouths, which form the is. of Montreal, and its drainage area measures about 80,000 sq. m. During its course it widens into numerous lakes of considerable size, and is fed by many important tribs. The O. is connected with Lake Ontario at Kingston by the Rideau Canal. An immense lumber trade is done on the riv.

Ottawa, tribe of N. Amer. Indians, of Algonquian stock, whose original home was on the upper O. Riv. They fought many wars with Eng. and Amer. colonists during the 18th and 19th cents. One of their chiefs was the famous Pontiac (q.v.). To-day they number under 2000, mostly in Michigan.

Ottawa Conference, Imperial economic conference of the Brit. Commonwealth of Nations, held at Ottawa in July 1932. A series of trade agreements were concluded between the U.K. Gov. and the govts. of the dominions, the general principle being to grant free entry for dominion imports into the U.K. market in consideration of preferences for U.K. exports in dominion markets. These agreements were for a period of 5 years ending July 1937, but were to continue unless either party gave 6 months' notice of termination. The O. C. tried to dovetail the new protectionist policy of Great Britain into the long-standing protectionist policies of the dominions. Great Britain and the dominions assumed reciprocal obligations, both of a general and a detailed character, to give preferential treatment to each other's commerce. Foreign critics, like Brit. free traders, suggested that the Ottawa treaties were a violation of Great Britain's international obligations and an unprovoked attack on the livelihood of neighbours. Though some of the colonies, especially the rubber- and tea-producing colonies like Ceylon and Malaya, would have preferred the continuance of the free-trade system, others, like the W. Indies and Mauritius, wanted a sheltered market for their basic

products. The Ottawa programme has long been obsolescent, if not obsolete, for in the course of the immediately succeeding years agreements were made which considerably modified the treaties or agreements made as a result of the conference. It soon became evident that the empire market could not attempt to give complete shelter to all producers in the empire. Foreign nations, moreover, retaliated where they were penalised in dominion markets so as greatly to damage some leading dominion export industries, notably Australian wool, although Australian dairy produce, lamb, fruit, and wine exporters were able to ignore overseas reactions, having secured a privileged position they had won in the Brit. market. Hence Australia moved gradually away from the doctrine of Ottawa and towards that of the world market. A corresponding movement in Great Britain has acquired comparable momentum.

In 1938 the U.K. and Australian Govs., by way of prelude to their new treaties with America, issued a joint statement proclaiming that the imperial market was not large enough to satisfy the productive energies of their peoples. They again alleged their vital interest in the system of imperial preferences, but qualified this by insistence on an even greater interest in the worldwide movements of trade, shipping, and capital. Canada, too, saw opportunities of expanding trade through an economic *rapprochement* with the U.S.A., and in 1938 both the Canadian and U.K. Govs. signed agreements with the U.S. Gov., by which time all the sovereign govts. of the empire were ready to sacrifice substantial preferences for the sake of a revival in world trade. The Atlantic Charter (1941), Mutual Aid Agreement (1942), Hot Springs Conference Resolutions (1943), and the General Agreement on Tariffs and Trade Conferences at Geneva, Havana, Annecy, and Torquay (1947-51) henceforth thrust the advocates of imperial preference on the defensive until Mr J. Diefenbaker's (q.v.) advent to power in Canada in 1957. See DUMPING; FREE TRADE; GENERAL AGREEMENT ON TARIFFS AND TRADE; IMPERIAL PREFERENCE; PROTECTION; TARIFFS. See text of the (anti-Ottawa) resignation letter of the 10 Brit. Free Trade Ministers, 28 Sept. 1932; J. B. Condliffe, *Reconstruction of World Trade*, 1940, and *Commerce of Nations*, 1950; F. C. Benham, *Great Britain under Protection*, 1941; D. Abel, *A History of British Tariffs, 1923-1942*, 1945; R. S. Russell, *Imperial Preference*, 1947.

Otter (*Lutra lutra*), most adaptable member of the weasel tribe, able to climb, swim, and run for a short distance as fast as a fox. O.s vary in size and weight; the average adult's head and body are about 2½ ft. and the tail 1½ ft. long. The skull, with its small facial space, bears a considerable resemblance to that of a seal, and the neck is large, so that the head appears to be directly attached to the body. The tail is long, tapering, and flattened, the limbs are short and the toes webbed. The fur is perfectly suited to

the O.'s amphibious life; it consists of long, close, glistening hairs, with a short, fine underfur. O.s appear to breed only once a year, but cubs have been found in every month, though from mid winter to May is probably the usual littering time. The female makes a nest in a hollow in a riv. bank, and the cubs remain with her for the greater part of their first year. The dog O. is polygamous, and wanders great distances, travelling by night and lying in holes during the day. O.s appear to have a periodic desire for salt water, and frequently descend to estuaries and the sea coast, where they live on rock fish, molluscs, and crustaceans. In fresh water, eels and frogs, as well as a few birds and mammals, form the prin. food. O. hunting is the only form of chase with a pack of hounds hunting the scent that is pursued from May to Aug. There are over 20 estab. packs of otterhounds in Britain. See *Encyclopaedia of Sport* and R. Colville, *Beagling and Otter-hunting*, 1930.

Otterburn, vil. of Northumberland, England, on the R. Rede, 23 m. from Hexham. About ½ m. distant is the site of Chevy Chase battle, fought between the English and the Scots (1388), in which Hotspur was defeated by the Earl of Douglas. Pop. 360.

Otterhound, descendant, like other hounds, of the old S. hound, and long bred in a few dists. for the very exacting sport of otter hunting, in which it is unrivalled. It is exceedingly sagacious, and has much of the fine qualities and powers of the bloodhound and foxhound, while it is essentially a water dog, capable of great endurance. The rugged head is somewhat between those of the 2 hounds mentioned; eyes large and deep-set, showing the haw; ears long and sweeping, set low and lying close, not feathered down to the tips; and nose large with expanding nostrils. The neck is rather long and muscular, with a loose folded dewlap, the back is wide and arched, the shoulders sloping, and the chest is deep but not wide. The feet are large and spreading, with firm pads and strong nails. The stern is carried gaily when the hound is at work, and is thick and well covered, affording assistance in steering in the water. The coat is abundant, long, and close at the roots, and hard, wiry, and waterproof. The colour may be grey, buff, yellowish, black, or rufous-red mixed with black or grey. The average height is about 23 in.

Ottery St Mary, mrkt tn and urb. dist. of Devon, England, 12 m. E. of Exeter, on the R. Otter. The vale of Otter is noted for its beautiful scenery and trout fishing. The par. church of St Mary is one of the finest in England. Its hist. may be traced back to 1061 and a Norman font has been discovered. In the 14th cent. Bishop Grandison rebuilt much of the 13th-cent. structure, transforming it into a collegiate church, which status it held until the Reformation. The building bears striking similarities to Exeter cathedral, on which Grandison also worked. The dist. contains good examples of Elizabethan architecture at Cadhay and

**Knighthood.** Escot Grange was the 'Fair-oaks' of Thackeray's *Pendennis*. Coleridge was b. in O. St M. The ann. carnival, said to have originated in 1688, is held on 5 Nov. Pop. 4000.

**Otto I, or Otto the Great** (912-73), Holy Rom. Emperor, son of Henry the Fowler, at whose death in 936 he was crowned King of the Germans at Aix-la-Chapelle. He stopped the progress westwards of the Magyars and Wends, made Bohemia, Denmark, and Poland his tributaries, and estab. a great empire throughout central Europe. His great victory against the Magyars (955) was especially outstanding. In 961 he invaded Italy for the second time and was crowned emperor of the W. (962) for the second time. See K. Hampe, *Otto der Grosse*, 1923; R. Holtzman, *Kaiser Otto*, 1936; M. Lintzel, *Die Kaiserpolitik Ottos*, 1943.

**Otto II, or Rufus** (955-83), Holy Rom. Emperor, son of O. I and Adelaide of Italy. He had been crowned joint emperor in 967. On the death of his father in 973 he was forced to fight for his crown against his cousin, Henry of Bavaria, whom he defeated and sent into exile. He then invaded France and succeeded in laying waste Champagne, but was defeated at the Aisne, and eventually lost Lorraine. He subsequently had to deal with a revolt in Rome and a Gk attack in S. Italy.

**Otto III, or Otto** (980-1002), Holy Rom. Emperor, son of O. II and Theophano, daughter of the Gk emperor. He succeeded to the throne as a child of 3 in 983, and during his minority great power was obtained by Crescentius whom he later put to death (998). In 996 O. was crowned emperor by Pope Gregory V, his relative. His anti-Ger. feelings are shown in his support for the Poles and Hungarians; he was eventually driven from Rome by a rebellion.

**Otto IV** (c. 1174-1218), Holy Rom. Emperor, son of Henry the Lion, Duke of Bavaria, and Matilda of England. He spent some time at the court of Richard I of England, and assisted him in his wars with Philip Augustus. In 1197, on the death of the Emperor Henry VI, O. became the Guelph candidate for the throne in opposition to Philip of Swabia, supported by the Ghibellines. After a long struggle Philip was victorious, but he was assassinated in 1208 and O. was crowned emperor in 1209. He at once became involved in a conflict with Pope Innocent III, and was excommunicated and deposed (1212). Frederick II being elected emperor in his place. In 1214 he was utterly defeated at Bouvines by the Pope's ally, Philip Augustus.

**Otto I** (1816-67), King of Greece, a son of the King of Bavaria. He was invited to become King of Greece, 1833. His rule was never very stable: a revolution in 1843 resulted in the granting by O. of a constitution, but in 1862 a further revolution led to his abdication, and he went into exile in Bavaria, where he d.

**Otto, Nicholas**, see GAS ENGINES.

**Otto of Roses**, see ATTAR OF ROSES.

**Otto the Great**, see OTTO I.

**Ottoman Bank**, prin. foreign bank in Turkey. It was estab. in 1863 as the Imperial O. B. (an Anglo-Fr. institution) by imperial firman under a concession from the Turkish Gov. The title was altered to O. B. in 1925. It has a branch in every important tn in Turkey. The chief offices are in Istanbul, London, and Paris. The O. B.'s agreement with the Turkish Gov., which was extended in 1925, 1933, and again in 1952, expires in 1975.

**Ottoman Empire**, see TURKEY.

**Ottrelite**, blackish- or greenish-grey mineral, occurring in shining oblong plates more or less hexagonal, in argillaceous schist. It belongs to the chloritoid group, and is probably monoclinic.

**Ottumwa**, city, cap. of Wapello co., Iowa, U.S.A., rail centre on Des Moines R. with hydro-electric plant in agric. and coal-mining area, 15 m. ESE. of Des Moines. It has meat-packing plants, foundries, and iron works and manuf. farm and mining machinery, tools, and mill-work. Pop. 33,600.

**Otus**, see ALLOIDAE.

**Otway, Thomas** (1652-85), dramatist, b. Trotton, Sussex. He was educ. at Winchester and Christ Church, Oxford, and afterwards went on the stage. He was unsuccessful as an actor, but used his theatrical experience in writing plays. His tragedy, *Alcibiades*, was produced in 1675 with Mrs Betterton and Mrs Barry in the cast, and *Don Carlos* followed in 1676. *Titus and Berenice*, a tragedy adapted from Racine, and *The Cheats of Scapin*, a farce from Molière, were acted on the same night in 1677, and *Friendship in Fashion* appeared in 1678. But O. is best remembered for *The Orphan*, 1680, and *Venice Preserved*, 1682, both of which have been frequently revived. He excelled in depicting the stronger passions, and has been called 'the most pathetic and tear-drawing of our dramatists.' But his plays brought him little money; his short life was marked by poverty and misery, and he is said to have d. of starvation at an inn. His works were ed. by T. Thornton in 1813, with a life. See his life by Dr Johnson; also R. G. Ham, *Otway and Lee*, 1931.

**Otztal**, valley in the prov. of Tirol, Austria, through which the Otz flows N. from the Otztaler Alps (Wildspitze, 12,470 ft) to join the Inn. It is known for its scenic beauty.

**Ouachita, or Washita**, riv. rising in W. Arkansas, U.S.A., connected with the Mississippi by the Tensas series of bayous. It flows E., SE., and S. through Louisiana into the Red R., 35 m. NW. of the latter's confluence with the Mississippi. Length about 605 m., navigable to Arkadelphia, Arkansas.

**Oudenaarde** (Fr. Audenarde), tn in the prov. of E. Flanders, Belgium, on the R. Scheldt, 15 m. SW. of Ghent. Its tn hall dates from the 16th cent. Once noted for its tapestries, it now manufs. linen and cotton, and has tanneries. Marlborough here defeated the French under the dukes of Burgundy and Vendôme (1708). Pop. 6600.

than when the opposite conditions obtain. Mobile troops, acting in conjunction with air units, are able to obtain information at comparatively great distances from the O., and give them timely warning on such important points as strength and direction of the enemy's march. In their turn they must ensure that their own position is not observable from the air or by enemy telescopes. The body detailed for outpost duty moves forward covered by a screen of scouts. Behind this screen the outpost commander chooses his line, and decides on the positions for the various portions of his force. Patrols are also sent out to observe special points and ground not in view from the outpost but near enough to it to be of value to the enemy. Persons passing through the outpost line are challenged, and the outpost commander is given definite orders as to the disposal of the various kinds of individuals who may endeavour to pass.

**Outram, Sir James** (1803-63), soldier, b. Derbyshire. He entered the Indian Army in 1819, and soon acquired an excellent reputation not only as a soldier but also as a political agent. In 1842 he was described by Sir Charles Napier as 'the Bayard of India.' He rendered valuable service in the first Sikh war, and from 1847 to 1851 was resident at Baroda, and from 1855 in Oudh. He went with Havelock to the relief of Lucknow, and commanded the garrison there during the second siege. He was created baronet in 1858, and appointed military member of Lord Canning's council. He pub. sev. books on India. See lives by Sir F. J. Goldsmid, 1880, and L. J. Trotter, 1903.

**Outward Bound Trust**, formed in 1946 to take over the first O. B. school, the sea school at Aberdovey founded in 1941, and to establish further schools which would enable the trust to train 5000 boys each year. The idea of the O. B. organisation was conceived by Kurt Hahn (then headmaster of Gordonstoun) and Lawrence Holt (of the Blue Funnel Line) who together estab. the original sea school. Schools are intended to be residential, to provide courses of 26 days' duration for boys of 15-19, and to 'give boys from all walks of life an opportunity of training through the sea, mountains, or other natural elements, as a means of developing their own capacity to face hazards, difficulties, hardship, and emergencies of all kinds.' Schools are based on Christian principles but without political or sectarian bias. Three further schools have now been estab., a mt school at Eskdale, Cumberland, another sea school at Burchhead on the Moray Firth, and a second mt school at Watermilllock, Ullswater. In 1951 the trust decided to adapt its training for girls, and sev. special courses have been held in collaboration with the Central Council of Physical Recreation. It is hoped to run 3 schemes for girls annually, each lasting 26 days and open to girls aged 16-19. The London H.Q. of the O. B. T. are at 123 Victoria Street, S.W.1.

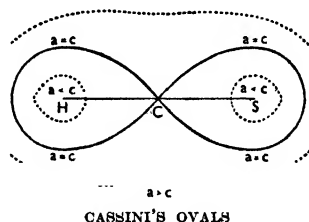
**Ouverture, Pierre Dominique Toussaint L'**, see TOUSSAINT.

**Ouvirandra**, see APONOGETON.

**Ouzel, or Ousel**, see BLACKBIRD; DIPPER; RING OUSEL.

**Ovalle**, tn of N. Chile, named after a former president, 60 m. S. of Coquimbo. It is the centre of a fruit-growing and mining dist., watered by the Limari R., and wool is also grown. There are thermal springs in the vicinity. Pop. 32,650.

**Ovals**. *Cartesian Ovals*, elaborated by Descartes; the locus of a point so moving that the sum or difference of given multiples of its distances from 2 fixed points remains constant. Its equation is expressed in the form  $r_1 \pm \mu r_2 = a$ . The ellipse and hyperbola belong to the family since if  $\mu = \pm 1$ ,  $r_1 \pm r_2 = a$ , which is a well-known property of the ellipse and hyperbola, the former if the + sign is taken and the latter if the - sign is used.



*Cassini's Ovals*, the locus of a point so moving that the product of its distances from 2 fixed points is constant, or  $r_1 r_2 = c^2$ . In the figure these points are indicated by H and S and if  $HC \cdot SC = c = a$  the oval becomes a lemniscate the polar equation of which is  $r^2 = 2a^2 \cos 2\theta$ . The inner curve represents a lemniscate and the outer curve a Cartesian oval.

**Ovambo**, one of the prin. native races of SW. Africa. They are a Bantu race, engaged in agriculture. They still have an unimpaired tribal organisation. They came into SW. Africa at a later date than the Hottentots (12th cent.), but before the Hereros, and made their home in the N. of Hereroland. Every O. tribe has its special organisation and particular customs. In physical appearance and growth of hair the O.s resemble the Hereros, but a thickset build predominates, whereas the Hereros are often tall. Many O.s, like the Hereros, in former times bore a tribal token on their eye-teeth, and their pleasures were raiding and protracted expeditions in the uninhabited parts of the tribal ter. Their chief food is a porridge of Kaffir-corn and millet, milk, meat, beans, melons, and ground-nuts. They make plates, bowls, and baskets, both ornamental and useful. Their numbers approximate to 120,000. Ovamboland, even under Ger. rule, was left to the operation of its own tribal organisation, and it represents to-day the one area in SW. Africa in which the organisation can be utilised by the administration as an organ of gov. Its area is about 16,000 sq. m. See H. Vedder, *South-West Africa in Early Times* (trans. by C. G. Hall), 1938. See also HERERO.



**Ovar**, tn of Portugal, in Aveiro dist., on the Aveiro lagoon, 15 m. N. of Aveiro (q.v.). It has sardine fisheries, and paper and hardware manufs. Pop. 7000.

**Ovariectomy**, or **Ovarietomy**, in surgery the removal of the uterine appendages, e.g. the ovaries and the Fallopian tubes. It was first performed by M'Dowell of Kentucky in 1809, and by Charles Clay of Manchester in England in 1842. In 400 cases which the latter dealt with, the mortality was over 25 per cent; but this major operation, once regarded as one of the gravest in the sphere of surgery, is now associated with a lower mortality than any other.

**Ovary** forms, together with the tubular appendages, the female reproductive system. There is one on each side of the uterus, which is placed in the centre of the pelvic cavity. Each is contained in a fold of peritoneum known as the broad ligament, and connected to the uterus by the Fallopian (uterine) tube. Each O. contains groups of germinal cells, known as Graafian follicles, and in the centre of each of these is a primitive ovum. It has been estimated that there are 30,000 such ova in the O., and these follicles are all connected by and embedded in tissue known as the stroma of the O. The Graafian follicles are contained in the superficial or cortical portion, while the deep or medullary portion is highly vascular, and is reddish in colour. The O. is oval and is about  $1\frac{1}{2}$  in. long and  $\frac{1}{2}$  in. thick. Ovulation, or rupture of the wall of the Graafian follicle, occurs in the majority of women midway between 2 menstrual periods, and so an ovum is liberated and passes by way of the Fallopian tubes into the uterus. If it has been fertilised, it then further develops, as explained under BIOLOGY and EMBRYOLOGY, while if not it is thence extruded. The O. produces the female sex hormone oestrone; another hormone, progesterone, is formed in the corpora lutea which develop from the ruptured Graafian follicles. See ANATOMY; BIOLOGY; EMBRYOLOGY.

In plants the O. is that part of the pistil which contains the ovule, and from which the fruit will later be formed. See BOTANY; FERTILISATION; FLOWER; FRUIT; SEED.

**Ovary** (in botany), see FLOWER; FRUIT; FERTILISATION.

**Ovation**, lesser triumph (q.v.) awarded to a Rom. *imperator* who had achieved minor success or success in a minor war. The Senate did not head the procession; the general entered on foot or horseback instead of in a chariot; he was clad in the *toga praetexta*, or ordinary magistrate's robe, instead of the *tunica palmata* and *toga picta*, and was crowned with myrtle instead of laurel. A sheep was sacrificed instead of an ox, hence the term (*ovis*, sheep).

**Oven**. The oldest types of O. are arched in shape, and built of stone or brick, and are heated by burning a wood fire within them. When the walls are thoroughly hot, the fire is raked out and the material to be baked inserted on a long narrow

wooden shovel called a peel. The baker's O. commonly in use is an improvement upon this type. Thus the fire is confined to a separate fire-place, either opening into the O., fixed within it, or so arranged that it can be moved about it, so ensuring equable heating. Tile or stone is mostly used for the bottom, or sole, of the O., and a draw-plate, or movable false bottom, is substituted for the peel. Coke or anthracite is often used as fuel. O.s for more general use are best made of iron, and are usually heated externally by flues, regulated by dampers, which convey the heat from a fire. For domestic use O.s are heated by superheated steam, by gas, or by electricity, coal, etc., and contain iron shelves which may be moved up or down to regulate the amount of heat which reaches the article to be cooked. Special O.s are made for biscuits and confectionery, containing revolving bands on which the material is baked. The temp. may be gauged by a pyrometer.

**Oven-bird**, popular name for a family, Furnariidae, of S. Amer. passerine birds. It is so called on account of its wonderful oven-like nest, which is a massive structure, weighing often about 8 lb., and placed on the bough of a tree. It is composed of mud and pieces of sticks and straw and animal hairs. The white eggs are laid upon a bed of soft dry grass in a large chamber which is reached through an antechamber. The birds are monogamous, and share the duties of incubation. Darwin, in his *Naturalist's Voyage* 1845, gives an interesting description of 2 species, both of a reddish tint of plumage. One, *Furnarius cucullarius*, builds its nest at the bottom of a narrow cylindrical hole.

**Oven**, anct bor. of Cheshire, England, now a ward of the urb. dist. of Winsford (q.v.). St Chad's church, restored in 1534 and in 1870, dates back to the 12th cent., and is probably built on the site of an even earlier church. The right of holding a cattle fair was granted by Edward I.

**Overbeck**, Johann Friedrich (1789-1869), Ger. painter, b. Lübeck. At Rome, with others, he formed in 1810 the Pre-Raphaelite brotherhood known as the Nazarenes, the object of which was to revive Ger. art on a purely religious basis. He was the leader of the revival of Rom. Catholic art, intensely idealistic but not a great painter. Among his best works were the frescoes at Berlin dealing with the life of Joseph; the 'Vision of St Francis,' at Assisi; 'Jerusalem Delivered,' at Rome; 'Christ in the Garden,' at Hamburg, etc. See studies by H. Atkinson, 1882; W. Howitt, 1886; K. G. Helse, *Overbeck und sein Kreis*, 1928.

**Overburden**, see MINING.

**Overbury**, Sir Thomas (1581-1613), poet and courtier, b. Warwicks, was educ. at Oxford and the Middle Temple. In 1601 he met Robert Carr at Edinburgh, and went with him to court. In 1608 he was knighted and became the king's servitor-in-ordinary and in 1609 travelled in the Netherlands. He had been involved in the intrigues of Carr (then Viscount Rochester) with Frances, Lady

Essex, but opposed Rochester's design to obtain Lady Essex's divorce and marry her. He thus gained the lady's enmity, and in 1613 was sent to the Tower on a trivial pretext, and there was apparently slowly poisoned by her agents. An inquiry was held in 1615, and 4 of the conspirators were hanged. Rochester (then Somerset) and Lady Essex, who were then married, were pardoned. See E. A. Parry, *The Overbury Mystery*, 1925; W. McElwee, *The Murder of Sir Thomas Overbury*, 1952.

**Overcrowding.** Abatement of. The Sanitary Act, 1866, dealt with the subject of O., and it has been dealt with in all subsequent legislation on housing. The Housing Act, 1935, which was sponsored by the minister of health (Sir Kingsley Wood), introduced new measures for the abatement of O. and the fixing of a national standard of accommodation. The Housing Acts, 1936, 1957, Part IV, re-enacted these provisions. The minister of health remains the central authority for O.

O. is defined in the Housing Act, 1936, by reference to either the number of persons sleeping in the same room or the number of persons in relation to the number and floor area of the rooms. A dwelling-house is deemed to be overcrowded at any time when the number of persons sleeping in the house either (a) is such that any 2 of those persons, being persons 10 years old or more of opposite sexes and not being persons living together as husband and wife, must sleep in the same room; or (b) is, in relation to the number and floor area of the rooms in which the house consists, in excess of the permitted number of persons as defined in the Sixth Schedule to this Act. In determining the number of persons sleeping in a house, no account shall be taken of a child under 1 year old, and a child who had attained 1 year and is under 10 years old shall be reckoned as one-half of a unit.

*Number of persons permitted to use a house for sleeping.* For the purpose of this Act the expression 'the permitted number of persons' means, in relation to any dwelling-house, either (a) the number specified in the second column of Table I in relation to a house consisting of the number of rooms of which that house consists; or (b) the aggregate for all the rooms in the house obtained by reckoning, for each room therein of the floor area specified in the first column of Table II, the number specified in the second column of that table in relation to that area; whichever is the less. For the purposes of Table I, no regard is had to any room having a floor area of less than 50 sq. ft.

Table I

No. of Rooms	No. of Persons
1	2
2	3
3	5
4	7½
5 or more	10

with an additional 2 in respect of each room, in excess of 5.

Table II

Floor Area of Room	No. of Persons
110 sq. ft. or more	2
90 sq. ft. or more, but less than 110 sq. ft.	1½
70 sq. ft. or more, but less than 90 sq. ft.	1
50 sq. ft. or more, but less than 70 sq. ft.	½
under 50 sq. ft.	nil

The standard of O. may be relaxed by the minister only where a large proportion of the housing accommodation in the area is constituted by dwelling-houses consisting of few rooms or rooms of exceptional floor area, and then only after consultation with the Central Advisory Committee. The local authority may also relax the standard by licence, but only owing to the existence of exceptional circumstances, including seasonal increases of pop., e.g. influx of visitors at holiday times. In any event there is a time limit on relaxations. Both the landlord and the occupier are made responsible for O. and there are statutory defences available, e.g. if alternative accommodation was offered and refused. The steps to be taken by the local authority with regard to O. are by way of inspection and report, followed by proposals for new accommodation, and the dates when these steps have to be completed are fixed by the minister. If the result of the inspection is such as to call for a *redevelopment scheme*, the local authority will have to pass a resolution to that effect and within 6 months prepare a redevelopment plan for submission to the minister (see CLEARANCE AND REDEVELOPMENT). As from the expiration of 6 months from the appointed day, the local authority, on the application of the landlord or occupier, must state the number of persons permitted, and make an entry thereof in the rent book.

Information as to the rights and duties in respect of O. may be published by the local authority. A landlord must inform the local authority of any case of O. in his houses within 7 days after the fact first comes to his knowledge. See also HOUSING and OVERFILL.

**Over-current,** electric current exceeding the maximum for which the circuit is designed causing O. relays to open circuit-breakers, switch-off motors, and generally activating protection devices. It may result from overload, short circuit, or switching operations.

**Overhead Charges,** also described as 'indirect expenses,' 'establishment charges,' 'oncost,' 'burden,' are those business expenses, such as rent, management salaries, bookkeeping, accountancy, and interest on loans, which cannot be directly arrived at in a particular piece of work and are usually provided for by a sufficient amount being added to the other charges to maintain the required profit. Different expenses in business fall under the description of O. C. or direct charges, according to the methods of the firm and the nature of the work; e.g. the wages of a man in the

factory are a direct charge on the work done, while the wages of a man in the warehouse may be a charge on the business as a whole. See W. A. Lewis, *Overhead Costs*, 1949.

**Overijse**, tn in the prov. of Brabant, Belgium, 10 m. SE. of Brussels. There are about 11 000 hothouses on the ter. of this com., which is famous for its cultivation of grapes. Early tomatoes, strawberries, peaches, and roses are also raised here. Pop. 11,000.

**Overijssel**, or **Overysel**, prov. in the NE. of the Netherlands, extending from the IJsselmeer to the Ger. frontier. The land consists largely of sandy flats, covered with waste stretches of heath and fen, but there is some fertile pasture ground along the shores of the IJsselmeer, where cattle-rearing and cheese- and butter-making are the chief industries. Reclamation in the E. has added to the fertile soil (see also **NORTH-EAST FOLDBERG**). Cotton-spinning is carried on in the dist. of Twente, and fishing in the ports of the IJsselmeer. The prin. tns of the prov. are Zwolle (cap.), Enschede, and Hengelo. Area 1295 sq. m.; pop. (1954) 718,430.

**Overland**, Arnulf (1889- ), Norwegian lyric poet, b. Kristiansund. He has used his poetry as a weapon, crying out against social injustice in such poems as *Brød og vin* (Bread and Wine), 1919. He made a creed of Socialism and scorned Christianity, in *Ordt alvor til det norske folk* (Words in Earnest to the Norwegian People), 1940. He challenged Hitlerism in his poems in *Den røde front* (The Red Front), 1937, and when the Germans invaded Norway he estab. the pattern of Norwegian resistance with his powerful poems, later collected under the title of *Vi overlever alt* (We shall live through All), 1945. His poems combine a masterly form with a profound love of truth and justice. He was put in a concentration camp as a result of these poems, but was liberated in 1945. His *Samlede Dikt* were pub. in 2 vols. in 1947.

**Overlord**, **Operation**, code name given to the allied invasion of Ger.-occupied Europe, mounted across the Channel. See **WESTERN FRONT IN SECOND WORLD WAR**.

**Over-Seas League**, founded by Sir Evelyn Wrench and incorporated by royal charter in 1910, with world H.Q. at Over-Seas House, St James's, London, and branches and representatives all over the world. It is open to membership by election, and on payment of the appropriate subscription, to Brit. subjects and Commonwealth citizens irrespective of party, colour, or creed. The O. L., with a membership, at the end of 1956, of over 53,000, seeks by means of cultural activities and social amenities to increase mutual knowledge and understanding between members of the various parts of the Commonwealth. To this end branches with club facilities are estab. in Great Britain at Edinburgh, Glasgow, Belfast, Nottingham, Cardiff, and Torquay; in Australia at Sydney, Hobart, Melbourne, Adelaide, Perth, and Brisbane; in New Zealand at Wellington,

Auckland, and Christchurch; in Canada at Toronto; and in Malta at Valetta. In many other places in the U.K. and overseas there are active branches without premises. Membership of the League carries entitlement to amenities everywhere. A magazine, *Overseas*, is pub. every other month and received by all members.

**Overseas Territories**, those forming part of the Commonwealth outside the fully independent and the self-governing tera. They formerly comprised mostly Crown Colonies, i.e. those in which the Crown retained the control of the Executive, but now, by common usage, signify those with elected assemblies, and sometimes with no elected, but with nominated, members in their legislatures. They may be (1) 'pure,' where the whole legislature is nominated, or (2) semi-representative, where part of it is chosen by election; thus invariably an official majority exists, although traditionally in most cases the Crown not only retains the right of veto on local legislation, but also the power to legislate directly by Order in Council.

The term Crown Colony was not in general use until the 1840's. It was the antithesis to the old colonial system of representative gov., and in its earliest use the term meant those conquered or ceded colonies in which the Crown retained, consciously, full authority. It was to provide for the gov. of Senegambia and of Quebec that the Crown Colony came into operation; the old representative system was impracticable or unsuitable because in the one an African pop. was incapable of assimilating itself to that system, and in the other there was an alien Fr. pop. Trinidad, when taken by Abercromby, was largely inhabited by Sp. people, who could hardly be expected to reconcile themselves to the abrogation of Sp. law or institutions. Later, however, the term Crown Colony became used for other colonies, whether conquered or settled. In the latter category, if the colony was settled by Brit. immigrants, these were generally supposed to take Eng. law and institutions with them (see **COLONIAL LAW**). Later still the term came to include a class of settled colony, under the authority of the Crown, in its pre-representative stage, e.g. New S. Wales in its early settlement period. It also came to embrace settled colonies in the tropics in which representative gov. was considered impracticable, e.g. Sierra Leone; the W. Indian colonies upon their abandonment of the old representative system, e.g. Jamaica by its own initiative in 1866 after the Negro insurrections and the general upheaval following emancipation; the conquered tropical African colonies of the late 19th cent.; and the colonial protectorates (q.v.). By this time the criterion of the Crown Colony, which originally sprang from the classic distinction between conquered and settled colonies, came to be founded on the distinction between self-governing colonies and non-self-governing colonies.

Brit. declared colonial policy to-day is

to guide ters. towards responsible self-gov. within the Commonwealth. To that end considerable attention is being given to social and economic reconstruction, education in its widest sense, and the development of responsibility in local gov., upon which political advancement depends. New constitutions have been introduced in many colonies, and major constitutional reforms have been inaugurated; there are very few ters. where there have not been constitutional changes since the close of the Second World War. The field for political advancement is greatest in Africa, and so far-reaching are the changes in some cases that the term Crown Colony has become a misnomer; e.g. the Gold Coast was granted independence and membership of the Commonwealth in 1957 under the name of Ghana. Nigeria has become a Federation with responsible govs. at the centre and in the regions, some of which have early expectation of achieving a restricted measure of internal self-gov. The Central African Federation, embracing the ters. of S. Rhodesia, N. Rhodesia, and Nyasaland, was estab. in 1953. A less restrictive and wider qualitative franchise now exists in Kenya. In Tanganyika an enlarged Legislative Council, with membership divided equally between the 3 main racial groups of the ter., European, Asian, and African, came into being in 1955. In Uganda a new ministerial system at the centre was inaugurated in 1955, together with a more widely representative Legislative Council in which African members (who sit on both the gov. and representative sides of the House) numbered 30 out of a total of 60. In the W. Indies the Caribbean Federation (q.v.) was estab. in 1958. See also COLONIAL DEVELOPMENT AND WELFARE; also COLONY; and COLONIAL TRUSTEESHIP.

See E. Jenks, *The Government of the British Empire*, 1937; Margery Perham, *Native Administration in Nigeria*, 1937; H. L. Hall, *The Colonial Office: a History*, 1937; Sir C. J. Jeffries, *The Colonial Empire and its Civil Service*, 1938; E. Barker, *Ideas and Ideals of the British Empire*, 1941; E. Walker, *Colonies*, 1944; P. T. Bauer and B. S. Yamey, *The Economics of Underdeveloped Countries*, 1957; Lord Hailey, *An African Survey* (revised 1956), 1957.

**Overseas Trade**, Department of, former joint dept of the Foreign Office and the Board of Trade, comprising the former Dept of Commercial Intelligence of the Board of Trade and part of the Foreign Trade Dept of the Foreign Office. It was formed in 1917 to promote and develop overseas trade, and later took over Foreign Office duties connected with commercial intelligence and with the commercial diplomatic and consular services. Since the Second World War it has been absorbed in the Board of Trade (q.v.).

**Overseer**, parochial official charged with the supervision of the poor in England and Wales. The office was estab. in 1601 and abolished in 1927. The O. formulated

and levied poor-rates, and prepared valuation, jury, and voters' lists.

**Overspill** may be said to mean the movement of persons and employment from congested and overgrown cities and tns to places at some distance capable of development and expansion as more or less self-contained communities. The term is comparatively recent in its application to housing, and O. is virtually the result of the Second World War. The Town and Country Planning Act, 1944, dealt mainly with 3 problems: 'blitz', 'blight', and 'overspill'.

Subsequent to the First World War, sev. of the larger local authorities adopted schemes of O. under the Housing Act, 1925. Thus the London Co. Council built a number of satellites at distances up to 10 miles, as at Dagenham in Essex; and as Manchester City Council did at Wythenshawe; and Liverpool City Council at Speke. In the two last instances the areas have since been incorporated in their respective cities. Liverpool is now building at Kirkby, which adjoins the city but remains in the area of the Lancs. Co. Council. This method still remains available to the local housing authorities. *New Towns* (q.v.) set up under the New Towns Acts, 1946-56, have been provided in 15 centres principally to deal with the problem of decentralisation or O. for the relief of Greater London.

*Town Development Act, 1952.* The purpose of this Act is to promote orderly and friendly arrangements between local authorities when steps are taken to decant O. pop. from one area to another. Accommodation for industrial and other activities should be included in the development for which provision is made, and also all appropriate public services, facilities for public worship, recreation, and other amenities. The Act represents an attempt to find a solution to this difficult problem within the framework of local gov. It affords an opportunity for local authorities to show their willingness and ability to co-operate in working out practical schemes for their mutual benefit. There are undoubtedly many small tns which could, with advantage, be expanded and which could afford to provide better social, cultural, and other communal facilities if they had the larger resources which an increase in pop. brings with it.

A co. dist. in which such developments are taking place is called a 'receiving dist.' The minister is authorised to make contributions to the council of a receiving dist. towards housing rate fund contributions, land acquisition, site preparation, and other works, main water and sewerage, and payments to a riv. board or drainage authority. A local authority, other than the council of a receiving dist., may provide for the compulsory acquisition of land. See also NEW TOWNS.

**Overstone**, Samuel Jones Loyd, 1st Baron (1796-1883), banker, b. London, educ. Eton and Trinity College, Cambridge. He was M.P. for Hythe during 1819-26, and contested Manchester in 1832. He succeeded his father as head of Jones

Loyd & Co., bankers (merged in London and Westminster Bank in 1864), in 1844. He was a great authority on banking and finance, and the Bank Act of 1844 was based on his principles. He wrote several treatises on currency, etc.

**Overtones**, see HARMONICS.

**Overtown**, tn in N. Lanarkshire, Scotland, 1½ m. SE. of Wishaw; it has extensive iron works, and is situated on the verge of the Clyde valley fruit-growing area. Pop. 2400.

**Overture**, work intended to serve as an opening to a larger composition, usually an opera, but often an independent composition for concert use, strictly speaking to stand first in the programme, but by no means always so used. It can nowadays be a piece of programme music, like a symphonic poem on a small scale, based on some literary subject or play, or description of some natural scene or historical incident. In the 18th cent., however, it was a suite of dances preceded by a large-scale prelude (slow introduction and fugal *allegro*) which was, strictly speaking, the 'overture' to those dances. The earliest operas had no O.s as such, but were generally prefaced by a prologue, often sung. The instrumental prelude became popular in Italy in the late 16th and early 17th cents., and was known as a *sinfonia* or *toccatà*. The form of the It. dramatic O. assumed a more permanent character with Scarlatti, who divided it into 3 sections. Lully, in France, laid foundations for the classical symphony by also dividing the O. into 3 parts: a slow introduction, a lively *allegro* in fugue form, and a dance form, generally a minuet. This type, called the Fr. O., became popular in England, and was used by Purcell and Haendel. At this stage of its development the O. bore little or no reference to the work it prefaced, so that it was not unusual for the O. to one opera to be played before the performance of another; and O.s were also written for oratorios and ballets. The reforms instituted in the field of the O. by Gluck and Mozart are of the utmost importance. The former closely identified the O. with the opera it prefaced, making it 'something analogous to the work itself,' and often (as, for example, in *Alceste*) joining it without a break to the first scene. Mozart further solidified the relationship between O. and opera by sometimes introducing into the former themes from the latter. Meanwhile in the concert-room the O. had branched off in another direction, developing into the symphony. In the late 18th cent. the It. O. became increasingly important. The early O.s of Cherubini foreshadowed those of Rossini, with their use of the cumulative *crescendo* now known as the 'Rossini *crescendo*.' Beethoven, continuing the forms of Gluck and Mozart, raised the O. to greater expressive and dramatic heights. The great *Leonora* O. No. 3 is, to all intents and purposes, a distillation of the opera *Fidelio* in symphonic form. The *Egmont* and *Coriolan* O.s are in the nature of independent compositions suitable for concert use. The O.s of Weber also adhere to the classical

form, and are closely allied with the operas, using themes appearing in them. In the 19th cent. an interest arose in the concert O. which, although it was usually written with a dramatic subject in mind, bore no relation to any opera. An example is Tchaikovsky's *Romeo and Juliet*, which resembles the symphonic poem more than the operatic O. Wagner employed the O. in various ways, and no two of his can be said to be alike. With the exception of the O. to *The Flying Dutchman*, which is in classical form, his most important O.s may be divided into 2 main groups, according to their functions: as a prelude, to suggest what is to follow, as with *Tannhäuser*, *Tristan*, and the *Meistersinger*; and primarily intended to set the proper mood, as with *Lohengrin* and *Parsifal*. Yet another type of O. is chiefly a pot-pourri of themes from the opera, arranged with an eye for their effectiveness. Among modern composers the trend of the O. is toward the shorter form, intended to prepare the mood of the opera. In Puccini's operas it has all but disappeared, and its disintegration can be watched in Verdi's, few of which have full-dress O.s (e.g. *La forza del destino*), some have preludes setting the general atmosphere (e.g. *Traviata*, *Aida*), and in the last two (*Otello*, *Falstaff*) the curtain rises almost immediately.

**Over-voltage**, voltage at any point of a circuit exceeding the maximum for which the circuit is designed, activating O. relays or being relieved through surge diverters, spark gaps, arc-suppression coils, or lightning arresters. It may be caused by thunderstorms, direct lightning stroke, or switching operations.

**Overysel**, see OVERJESSEL.

**Ovetum**, see OVIEDO.

**Ovid** (Publius Ovidius Naso) (43 BC.-c. AD 17), Lat. poet, b. Sulmo (Abruzzo) of an ancient equestrian family in easy circumstances. He was well educ., and trained for the Bar, studying for some time at Athens and settling at Rome. He had considerable forensic ability, pleaded in the court of the centumviri, and was made one of the *tresviri capitales*; but on coming into his father's estate left the law to take up poetry and pleasure. He had many friends, and lived a gay and licentious life in Rome and at his country seat. He was 3 times married, but only his third marriage was a success. In AD 8 he was suddenly banished by Augustus to Tomis, now Constanza, on the Black Sea. No reason for this is certainly known; but the cause is obscurely hinted at in sev. places in his works. He appears by an indication to have been in some secret, possibly, as has been suggested, about the emperor's grand-daughter Julia, of which Augustus wished to remove all evidence. But the ostensible cause of his exile was the immoral tendency of his love poems (cf. *Tristia*, ii. 207; iii. 49). O. suffered much from the climate and the lack of company. He was never allowed to return to Rome, and died in exile. His work is distinguished by its spontaneity and ease, its graceful elegance, and play of fancy; its descriptions of passionate,

tender, and pathetic scenes; its insight into human nature; and, previous to his exile, its air of gaiety and joyousness. The licentiousness of much that he wrote may be partly condoned by the manners of his age. His *Amores*, addressed to a certain (probably imaginary) Corinna, appeared in 16 B.C. His tragedy, *Medea*, which was praised by Quintilian and Tacitus, is now lost. The *Epistolae* or *Heroides* are imaginary love-letters written by famous heroes and heroines, and among the most refined and graceful examples of Lat. elegiac poetry. His *Medicamina Faciei Femineae*, on cosmetics, was followed by the *Ars Amatoria* (3 books) and the *Remedia Amoris*, dealing respectively with the methods of conducting and of getting over love affairs. His *Metamorphoses* (15 books), on which he based his hopes of immortality, never received his final corrections. It is brilliant and interesting, and contains passages of great beauty. The *Fasti*, designed to be in 12 books, of which only 6 were completed, is a poetical commentary on the calendar, dealing in elegiac metre with festivals and mythology. The period of his exile produced only comparatively unimportant works, including *Tristia Epistolae ex Ponto*, *Ibis*, *Haliastur*, and *Nux*. The best complete ed. is still that of N. Heinsius-P. Burmann (4 vols.), 1727; but there are many modern eds. and trans. of separate works. See E. K. Rand, *Ovid and his Influence*, 1926; F. A. Wright, *Three Roman Poets*, 1938; H. Fränkel, *Ovid, a Poet Between Two Worlds*, 1945; L. P. Wilkinson, *Ovid Recalled*, 1955.

**Oviedo** *y* Valdés, Gonzalo Fernández de (1478-1557). Sp. historian. b. Madrid. In 1514 he was sent by Ferdinand to St Domingo in the W. Indies as inspector-general of the trade of the New World, and during his term of office acted with great cruelty and barbarity to the Indians. On his return to Spain he pub. his *Sumario de la Historia General y Natural de las Indias Occidentales*, 1526. His prin. work is the *Quinquagenas*, containing a full account of the most important persons in Spain, their lineage, arms, revenues, etc., together with a fund of private anecdote.

**Oviedo**: 1. Sp. prov. in Galicia (q.v.), on the Bay of Biscay, also called the prov. of Asturias (q.v.). It is mountainous, containing part of the Cantabrian Mts (q.v.), and its valleys are picturesque and very fertile. Iron, coal, cobalt, and other minerals are found. Area 4205 sq. m.; pop. 901,500.

2. (anc) *Ovetum*, later *Civitas Episcoporum* Sp. tn, cap. of the prov. of O. It grew up around an 8th-cent. monastery. In the 9th cent. it was the cap. of the kingdom of the Asturias, and it was, later, a centre of resistance to the Moors. It was sacked by the French in 1809, and was badly damaged during a rising of Asturian miners against the gov. in 1934. There is a Gothic cathedral, mainly 15th cent., which has beautiful windows, and the tower of which is one of the finest in Spain, and there are many other anc buildings, including an 8th-cent. cloister.

The univ. dates from 1608. O. has iron works, and manufs. munitions, textiles, and leather goods. Pop. 112,850.



OVIEDO, AND THE CATHEDRAL

**Oviparous**, in zoology, term applied to birds, reptiles, fishes, and insects whose mode of reproduction is by the exclusion of a germ in the form and condition of an egg, the hatching of which takes place outside the body of the female parent. The lowest mammals (platypus and the spiny ant-eaters), all birds, most reptiles and fishes, and most invertebrates are O. See also OVOVIVIPAROUS.

**Ovoa**, see AVOCA.

**Ovolo**, in classical architecture, a convex moulding, see MOULDINGS.

**Ovoviviparous**, in zoology, term applied to animals whose mode of generation is by the exclusion of a living foetus more or less extricated from the egg-coverings, and which has been hatched within the body of the parent as an egg, i.e. without any placental attachment to the womb, so that the offspring have not been developed through direct connection with the blood-vessels of the mother, as in truly viviparous animals. Examples are the marsupials (except the bandicoots), the viper, fishes, such as certain rays, sharks, and toothed carps, the aphids (green flies), and various other invertebrates.

**Ovule** (Lat. diminutive of *ovum*, an egg), minute body of a circular or oval shape which occurs in the ovary of the carpel of a flowering plant. O.s may be solitary or numerous, and after fertilisation by the action of pollen become seeds. They consist principally of the nucellus, a central mass of tissue covered by one or more coats of integuments, and in most cases they are attached by a short stalk or funicle to the placenta, a ridge of tissue in the ovary. At the anterior end, the

micropyle, a narrow canal or opening leads to the nucellus. Down this the pollen tube passes in fertilisation. The form of the O., its arrangement on the funicle, and the relative position of the micropyle vary in different families. In Ranunculaceae, for example, the O. is always inverted, so that the micropyle and funicle adjoin. The O.s are grouped in the placenta in various ways, the chief being axile, free central, and marginal.

**Owain ap Gruffydd**, see GLENDOWER, OWEN.

**Owari**, or Bishu, anct. prov. of Japan, corresponding to the present-day Aichiken; largely a fertile plain, rice, wheat, barley, and horse-radish are extensively produced, and poultry rearing is important. The local clay is used in ceramics, an industry begun in 1297. Chief tn: Nagoya.

**Owen, John** (1560-1622), epigrammatist, b. Plas Dhu, Caernarvonshire, educ. Winchester and Oxford; he became headmaster of King Henry VIII School at Warwick. His lat. epigrams, which have both sense and wit in a high degree, gained him much applause, and were trans. into English, French, German, and Spanish.

**Owen, John** (1616-83), Puritan cleric, b. Stadhampton, Oxon, and educ. at Oxford, whence he was driven by Laud's statutes. Originally a Presbyterian, he changed to Independency. In 1649 he accompanied Cromwell to Ireland, and in 1650 to Edinburgh. As dean of Christ Church, Oxford (1658), he was one of the 'triers' of ministers appointed by Cromwell. After the Restoration he was ejected from his deanery, but was favoured by Clarendon, who tried to persuade him to conform by offers of high preferment. Charles II also held him in regard, and gave him money for the Nonconformists; and he was allowed to preach to a congregation of Independents in London. His great learning and ability made him a formidable controversialist, especially against Arminianism and Rom. Catholicism.

**Owen, Sir Richard** (1804-92), naturalist, b. Lancaster. He studied anatomy at Edinburgh under John Barclay, and, coming to London, held various posts in the Hunterian Museum at the College of Surgeons. He made his name with the pub., in 1832, of a memoir on the pearly nautilus. In 1836 he was appointed the first Hunterian prof. of comparative anatomy and physiology. His prin. works at this time were a *Catalogue of the Physiological Series of Comparative Anatomy*, 1833-40, *Odontography*, 1840-5, and *British Fossil Mammals and Birds*, 1844-1846. In 1856 the queen placed at his disposal for life Sheen Lodge in Richmond Park, and he became director of the Natural Hist. Museum at S. Kensington, for the estab. of which he was largely responsible. His *Anatomy and Physiology of the Vertebrates* appeared in 1868. He was undoubtedly the first anatomist of his day, and one of the greatest that ever lived. See life by his grandson, Rev. R. Owen, 1894.

**Owen, Robert** (1771-1838), Welsh Socialist, b. Newtown, Montgomeryshire, was a precocious lad who came to London, worked as a shopman in London and Manchester, and eventually became the owner of successful cotton mills at Chorlton. There, eventually, he instituted a system of co-partnership, and started schools for infants. His scheme, then an entire novelty, attracted much attention, and drew many famous persons to visit and consult him. He wished to improve the conditions of labour, and especially of child labour, and he was the prime mover of the Factory Act of 1819. His open declaration of religious scepticism made his schemes suspect. His communistic settlements in England and America proved to be failures, and he suffered considerable financial losses on account of them. His autobiography appeared in 1857-8. See lives by L. Jones, 1890; F. Podmore, 1906; G. D. H. Cole, 1930.

**Owen, Robert Dale** (1801-77), Scottish-Amer. social reformer and author, son of the preceding. Born and educ. in Glasgow, he accompanied his father to New Harmony, Indiana, 1825. In 1835 he was elected to Indiana Legislature, and was a member of Congress, 1843-7. O. took a leading part in founding the Smithsonian Institution, and was U.S. minister at Naples, 1853-8. Some of his puba. are *Footfalls on the Boundary of another World*, 1860, *Policy of Emancipation*, 1863, *The Wrong of Slavery*, 1864, *Debatable Land between this World and the Next*, 1872, and an autobiography, *Threading my Way*, 1874.

**Owen, Sir Stanley**, see BUCKMASTER.

**Owen, Wilfred** (1893-1918), poet, b. Oswestry, Shropshire. Educ. at Birkenhead Institute and London Univ., he was for a time tutor to a Fr. family near Bordeaux. In the First World War he enlisted in the Artists' Rifles, but was invalided out in 1917 and sent to Craiglockhart War Hospital, where Siegfried Sassoon (q.v.) was his fellow patient and encouraged him in verse-writing. Sent back to France as a company commander, he won the M.C. but was killed a week before the armistice in the crossing of the Sambre Canal. His *Poems*, 1920, ed. by Sassoon, shatter the illusion of the glory of war and bring home to us both its hollowness and wreckage and the beauty it has ruined. In technique his work is distinguished by the extensive use of assonance in place of rhyme, a feature in which O. looked forward to the later school of Auden and Spender (qq.v.). See *The Poems of Wilfred Owen*, ed. with memoir by E. Blunden, 1931.

**Owen Falls**, rapids of the Victoria Nile in Uganda, situated 3 m. below the Ripon Falls (q.v.) at Jinja. In 1949 an agreement between the Brit. and Egyptian Govs. was concluded for the construction of a dam here, for the production of hydro-electric power and the control of the Nile waters. Plans for this work were prepared and approved by the Egyptian Ministry of Public Works and the Uganda authorities. The scheme was formally opened by Queen Elizabeth II in April

1954. The cost was estimated in 1954 at \$26,000,000; the scheme will be operated by the Uganda Electricity Board. The estimated capacity is 150,000 kilowatts. See also NILE.

Owen Glendower, see GLENDOWER, OWEN.

Owen Sound, co. of Grey co., Ontario, Canada. It lies at the head of the large bay of the same name on the SW. shore of Georgian Bay (Lake Huron), and owes its name to the great impression made by the fine natural harbour on Capt. Owen, who conducted the first hydrographic survey of the Great Lakes shortly after the war of 1812-14 with the U.S.A. Owing to his glowing description the Brit. officials gave his name to the bay. The original name of the settlement was Sydenham, changed to O. S. in 1851. Incorporated as a tn in 1856, it became a city in 1920. It lies 110 m. NW. of Toronto, on both the Canadian Pacific and Canadian National railways. It is an important livestock shipping centre, and its chief industries include furniture; marine, mining, and heavy castings; woodenware; refrigerators; knitting; steel boats; stoves and furnaces; bolts, screws, and wire; tanning; lumber; paint and varnishes. Pop. 17,346.

Owen Stanley Mountains, mt chain in the E. of Australian New Guinea. The highest peak is Mt Victoria (13,200 ft), but there are sev. peaks over 10,000 ft high.

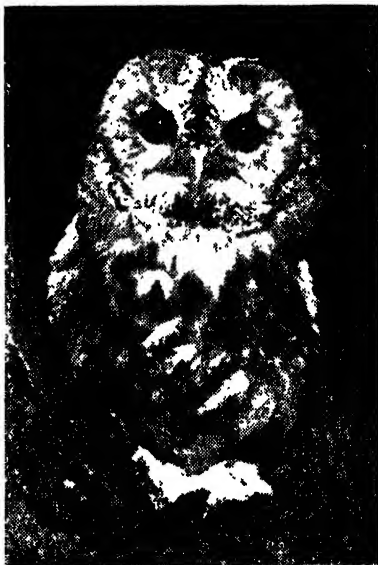
Owens, John (1790-1846), cotton merchant and founder of O. College, b. Manchester. He entered his father's business, and soon making a large fortune he was able to bequeath £96,000 for the erection of a college, on the condition that no test of religious belief or profession should be imposed on staff or students. See VICTORIA UNIVERSITY.

Owensboro, co. seat of Daviess co., Kentucky, U.S.A., on the Ohio R. It is an area of agriculture, oil and gas wells, coal-mines, clay, sand, and gravel pits, and timber. It is an important oil centre, tobacco market, and shipping point, with boat connections. O. manufs. radio valves, light bulbs, furniture and wood products, machinery, foodstuffs, and clay and metal products; it has distilleries, and there is an airport. Pop. 33,651.

Owl (order Strigiformes), distinguished from all other birds of prey, except the osprey, by the tarsus (of the leg bones) being half the length of the tibia, while the outer toe is able to be turned backwards or forwards at will. Another distinction is in the absence of the aftershield present in the feathers of all hawks; this is a small accessory plume which springs from the under side of the main feather. O.s are mostly nocturnal in habit, but some hunt for food in full daylight. The head is always large, the neck short and contracted, the eyes are directed forwards and are surrounded by a characteristic ruff of feathers. The short beak is hooked. O.s have long been the subject of much superstition, being universally regarded as birds of ill omen. This has undoubtedly had much to do with their ruthless persecution, and only in recent years has it been

realised that they are the most important check upon the excessive multiplication of rodents. In addition to these, reptiles, fish, and insects are eaten, and some species have been observed to feed on carrion. Indigestible remains of the food are cast up in the form of pellets.

Of the Brit. species, the barn, white, screech, or church O. (*Tyto alba*) is the most widely distributed throughout Britain. The colour of the plumage varies, but the upper parts are commonly tawny buff mottled with grey, white, and brown, and the under surface is whitish, or



John Markham

#### TAWNY OWL

sometimes yellowish, with grey spots. The face is white and the bill yellow, and a heart-shaped pattern of feathers is formed round the eyes and beak. The legs are long and covered with downy feathers. The eggs, which in all O.s are white, are laid in barns, church towers, and other buildings, as well as in hollow trees. The beautiful tawny or wood O. (*Strix aluco*) is more local in its distribution, and hides during the day in woods, commonly nesting in holes in trees. The ground colour is dark tawny or brown, approaching grey in some specimens. The short-eared or woodcock O. (*Asio flammeus*) frequents open places, and flies in the daytime as well as at night. Its distribution is more northerly than the others. The head, back, and wings are lightish brown, with darker brown patches; the under surface is buff or fawn, with blackish markings on the



breast; the legs are pale buff; and the toes, as well as the beak, are black. The eggs are laid on the ground in tufts of heather or furze, or on a clump of sedge or reeds. It is largely a winter migrant, appearing with the woodcock and departing in the spring. It is a great vole hunter. The long-eared O. (*Asio otus*) is distinguished by its ear tufts, which are about 1½ in. long. It feeds largely on sparrows, and is notorious for its habit of occupying other birds' nests. Other species which breed in Britain are the little O., which has been sev. times introduced and has spread rapidly of late, the beautiful snowy O., and the eagle O.

Owlglass, see EULENSPIEGEL.

Ownership, see POSSESSION and PROPERTY.

Owosso, city in Michigan, U.S.A. In livestock, grain, and coal area, 28 m. N.E. of Lansing. It manufs. stoves, plumbing supplies, and metal and wood products. Pop. 15,900.

Ox, domestic ruminant. A large number of varieties or breeds are distributed over the world. Their domestication began at a very early period of man's development, and the humped oxen of India (*Bos indicus*) have long been regarded as sacred. The European domesticated breeds are believed to have been derived from *B. primigenius*. The use of the ox as a draught animal was formerly very common, and still continues in many parts of the world.

Ox-bird, see DUN, OXBIRD.

Ox-bow, type of lake. By meandering courses, rivs. may form great loops: the neck of such a loop being eventually severed, a horse-shoe-shaped backwater is formed. The deposition of silt blocks up the ends, thus forming an O. lake. They are found, for example, in the lower Mississippi valley.

Ox-eye Daisy, or Dog Daisy (*Chrysanthemum leucanthemum*), perennial herb of the Compositae. It has daisy-like flower-heads with white rays and yellow disk florets.

Ox-pecker, passerine, starling-like bird of the family Buphagidae, of which there are 2 species, found in Africa. In colour they are a dingy brown, with tawny under surface and tail. They are strong fliers, of great swiftness, and insectivorous in habit. The various names, of which rhinoceros bird is one, are derived from their method of seeking food on the backs of the ox and rhinoceros.

Ox-wagon Sentinel, see OSSEWABRAND-WAG.

Oxalic Acid  $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$ , the first member of the homologous series of dibasic acids of the general formula  $\text{C}_n\text{H}_{n-2}\text{O}_4$ . It occurs as its acid potassium salt in many plants, especially in the wood-sorrel (*Oxalis acetosella*), and as its calcium salt in plant cells. In small quantities it is made in the laboratory by combining sodium and carbon dioxide at 360° C., or by quickly heating sodium formate to a high temp. It can be made by warming strong nitric acid (90 c.c.) on a water-bath, removing, and adding 25 gm. of cane-sugar. Oxides of nitrogen are

evolved, and after the reaction has abated the liquid is evaporated to small bulk. On cooling O. A. crystallises out. On the commercial scale it is prepared from cellulose in the form of sawdust. The sawdust is fused with a mixture of potassium and sodium hydroxides in iron pans. Potassium and sodium oxalates are formed, extracted with water, and treated with the requisite amount of sulphuric acid, when O. A. crystallises out in large, transparent, monoclinic prisms. The crystals contain 2 molecules of water of crystallisation, but slowly effloresce in the air, and become anhydrous at 100° C. It sublimes at higher temps. (160° C.), but is also partly decomposed into carbon dioxide and formic acid. Concentrated sulphuric acid decomposes it into carbon dioxide, carbon monoxide, and water. O. A. is easily oxidised by potassium permanganate in acid solution, and is estimated by means of a standard solution of the latter. The alkaline salts of O. A. are readily soluble in water. The 'salt of sorrel' of commerce is potassium quadroxalate  $(\text{COOH})_2 \cdot (\text{COO})_2 \cdot \text{KH} \cdot 2\text{H}_2\text{O}$ , useful for removing ink-stains. The calcium salt is insoluble, and serves to detect the presence of the acid. The acid is poisonous, but the calcium salt passes through the system unchanged. Thus, in case of poisoning, lime water or chalk is administered.

Oxalidaceae, dicotyledonous family of about 300 species, chiefly tropical, but a few of temperate zones; with alternate leaves without stipules, large 5-parted flowers in cymes, and capsular or berry fruits. Genera include *Averrhoa*, *Biophytum*, and *Oxalis*.

Oxalis, genus of annuals, perennials, and evergreens. The only Brit. species is *O. acetosella*, the Common Wood-sorrel. *O. corniculata*, Procurrent Yellow Sorrel, and *stricta*, Upright Yellow Sorrel have been introduced. Many handsome species are grown in the garden and the greenhouse, and one, *O. deppei*, has edible and radish-like roots, for which the plant is a good deal grown in France. It is grown in Britain for its elegant umbels of rose-red flowers.

Oxenford, John (1812-77), author, b. Camberwell, London. An accomplished linguist, he trans. Calderón's *Vida es Sueño* and Goethe's *Dichtung und Wahrheit*. The knowledge of Schopenhauer's philosophy in England dates from the appearance of his essay on 'Ironicism in Philosophy' in the *Westminster Review* (Dec. 1876). From about 1850 O. was dramatic critic to *The Times*, his appreciations being rendered useless through their excessive and indiscriminate amiability. Two of his best known plays are *My Fellow Clerk*, 1835, and *Twice Killed*, a farce, 1835.

Oxenham, John, pseudonym of William Arthur Dunkerley (1852-1941), novelist and religious poet, b. Manchester. He was educ. at Old Trafford School and Victoria Univ. He spent his early years in commerce, travelling in France and the U.S.A. He later took up the business side of journalism and was associated with Jerome K. Jerome in the periodicals the

*Idler and To-day.* Turning to writing, he pub. his first novel, *God's Prisoner*, in 1898. This and succeeding romantic novels gave him a vogue, to which in 1913 he added the popularity of *Bees in Amber*, a book of verse. In 1914 his 'Hymn for the Men at the Front' became very widely known. This was followed by other vols. of poetry, and after the war he wrote a number of books on the life of Christ, including *The Cedar Box*, 1924, and *The Hidden Years*, 1925. See life by his daughter, 1942.

**Oxenstierna, Axel Gustafsson, Count** (1583-1654), Swedish statesman, b. Fano in Uppland, and educ. at the univ. of Rostock, Jena, and Wittenberg. He became chancellor of Gustavus Adolphus (1611). During the king's absence in Livonia and Finland (1614-16) O. looked after affairs at home. As a diplomatist he arranged the marriage between his youthful sovereign and Marie Eleanora of Brandenburg, drew up an agreement with Denmark jointly to occupy Stralsund (1629), and negotiated the favourable truce of Altmärk with Poland (1630). After Gustavus's death at Lützen (1632) it was his courage and resourcefulness which kept the Protestant League together, and led, in 1633, to the formation at Heilbronn of the Evangelical Union. In the Dan. war of 1643-5 his tactical skill again proved invaluable. During the brief rule of Queen Christina, O. was handicapped by the jealousy of his young mistress, but he nevertheless opposed her abdication.

**Oxenstierna, Bengt Gabrielson, Count** (1623-1702), Swedish statesman, was appointed governor of Masovia, Great Poland, Kulm, and Kujavia (the Polish provs. which his country had conquered) in 1655. His spirited and prolonged defence of Thorn against the Poles ended at length in a capitulation so dignified that its terms were afterwards included in the Peace of Oliva (1660).

**Oxenstierna, Johan Gabriel** (1750-1818), Swedish poet, b. Fano, a nephew of Count Gyllenborg. He wrote a trans. of *Paradise Lost*, besides a number of original poems and odes and a eulogy of Gustavus III, at whose letter-loving court his academic effusions and graceful idylls were much admired. O. undertook many political and diplomatic missions for his king and patron, who in return created him marshal in 1792.

**Oxford, Edward de Vere, 17th Earl of** (1550-1604), courtier and poet. He went to Cambridge Univ. at the age of 8 and succeeded to the earldom and the hereditary office of Lord Great Chamberlain in 1562, when he was 12. Subsequently he was tutored by his uncle, Arthur Golding, the translator (q.v.). Of unruly temperament, he lost his friends through his insolence and pride, and his fortune by extravagance. He had some reputation as a writer of short poems, many of which appear in Elizabethan miscellanies, and is said to have written plays, none of which has survived. O. is one of sev. claimants that have been put forward as the writer of Shakespeare's plays, but like the others he is not worth considering.

See SHAKESPEARE, WILLIAM; also P. Allen, *The Case for Edward de Vere, Seventeenth Earl of Oxford, as 'William Shakespeare,'* 1930.

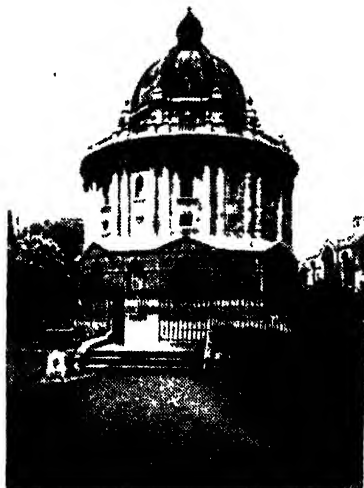
**Oxford, Robert Harley, Earl of, see HARLEY ROBERT.**

**Oxford, city, co. bor. and bor. constituency, episcopal see, and co. tn of Oxon,** is situated at the confluence of the Thames and the Cherwell, 52 m. WNW. from London (63½ m. by rail). Though the tn is famous chiefly for its univ., it owed its initial rise to other influences. It was situated between Mercia and Wessex, on one of the best of the fords across the Thames. Its importance in early times is shown by the first mention of it in hist., which occurs in the *Anglo-Saxon Chronicle* for 912. Here we read that in this year Edward, son of Ethelred, took possession 'of London and Oxford and all the lands obedient to those cities.' The tn probably made a stubborn resistance to the Norman invaders, and Domesday Book shows the reprisals which followed. To prevent further revolt the Norman governor, Robert D'Oilly, built huge works to keep the tn in submission. The remains of these are to be seen in the castle tower and parts of the churches of St Michael, St Peter in the E., and St Cross. The city again figures prominently in the troubles of Stephen's reign, and in 1142 the Empress Maud was besieged there, escaping over the riv. on the ice. But, with unimportant exceptions, the fortress was not again seriously attacked till the 17th cent., after which it ceased to rank as a place of strength, and rapidly fell into decay, though D'Oilly's tower has successfully weathered the storms of 8 cents., and even now is practically intact. In 1258 the Provisions of O. were drawn up there for the guidance of Henry III, and the Montfort rebellion thus took its rise. Again, in the civil war of Charles I's reign, O. figures as the chief cavalier centre, enthusiastic in support of the king.

Teaching is known to have been carried on at O. since the early years of the 12th cent. (see OXFORD UNIVERSITY). The fame of the univ. grew steadily, until by the 14th cent. it was the equal of any in Europe. But as the univ. grew, there was increased opposition between it and the tn, and this opposition often became so acute as to lead to terrific struggles. Now the univ. takes an active part in the city's administration, being directly responsible for the election of 12 of the 68 members of the city council. Only members of the univ. of the degree of M.A. or of a superior degree are eligible for election or to elect. A very interesting period in the hist. of O. is that which deals with the coming of the friars in the 13th cent.

The old tn of O. is built almost entirely in the angle formed by the Cherwell and the Thames, here called the 1st. The 4 main roads of the tn meet at the place known as Carfax (derived from Lat. *quadri-furcus*, 'four-forked'). Carfax Tower, said to have been built in the reign of Edward III, shows indications of a much earlier date. It was renovated in

1896, and the curious 'Quarter Boys,' relic of bygone days, restored to use. N. from Carfax runs Cornmarket Street, continued further N. as Magdalen Street. Where Cornmarket Street runs into Magdalen Street it is crossed by a thoroughfare known under the successive names (E. to W.) of George Street, Broad Street, Holywell Street, and Long Wall Street. It sweeps round in a large curve, and roughly marks the boundaries of the ancient city in that direction. Some fragments of the old wall still remain, notably as part of the wall of Merton Gardens. W. from Carfax runs Queen Street, continued



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THE RADCLIFFE CAMERA, OXFORD

as New Road. In Cornmarket Street is St Michael's Church: the tower is late 11th-cent. work. Not far from it is the church of St Mary Magdalene, an interesting building of various dates. Near by is the Martyrs' Memorial, a monument commemorating the martyrdom of Ridley, Latimer, and Cranmer, designed by Sir Gilbert Scott. S. runs St Aldate's as far as Folly Bridge, near which are moored the barges of the college boat clubs. Until near the end of the 18th cent., an ancient watch-tower, known as Friar Bacon's Study, rose over the old bridge. Eastwards from Carfax runs the High Street, off which is the univ. church of St Mary the Virgin, built between the 13th and 15th cents., except for the baroque porch, erected by Laud's chaplain, Dr Morgan Owen, in 1637. It was in St Mary's that Cranmer was degraded previous to his martyrdom; to St Mary's were brought from Cumnor the

mangled remains of Amy Robsart; and from its pulpit Keble preached his famous sermon on national apostasy. High Street passes over Magdalen Bridge. Magdalen Bridge commands fine views N. and S., the former the wooded heights of Headington Hill, with St Clement's Church in the middle distance, the latter Magdalen College school playing fields and a section of the botanic gardens. In High Street are the examination schools, used in the world wars as a military hospital, designed by Sir Thomas Graham Jackson, who also designed O.'s 'Bridge of Sighs,' connecting the 2 sections of Hertford College. Opposite to Hertford is the Bodleian Library, most of which was designed by Holt of York. Near it is the Clarendon Building which for many years was the home of the O. Univ. Press. Designed by Vanbrugh, both of its main elevations are stately; that on the S. contains a figure of Lord Clarendon, from the proceeds of whose book, the *History of the Rebellion*, the building was erected. The New Bodleian, designed by Sir Giles Gilbert Scott, was opened in 1947. Christ Church, one of the smallest, but certainly one of the most beautiful, of Eng. cathedrals, is a splendid example of Eng. church architecture. The pier-arches are early 12th-cent. work, as are the transepts and choir-aisles. 'Tom Tower' of Christ Church contains the famous bell from which the tower gets its name. The statue is that of Wolsey, who planned Tom Quad, and who conceived the Foundation of Christ Church, perhaps visualising the cathedral as a chapel for its members. O. has now expanded to take in many suburbs: Osney on the W., Grandpont on the S., St Clement's, Cowley, Headington, and Ifley on the E., and St Giles's, Summertown, and Wolvercote, which form a popular residential dist., on the N. At Wolvercote paper for the O. Univ. Press pubs. is made. There are sev. well-known schools in O. Magdalen College School was founded in 1480 by William of Waynflete for instruction in grammar; the college choristers, not originally members of the school, have since 1849 been boarded in the master's house at the expense of the college. St Edward's School, founded in 1803, was originally in New Inn Hall Street, being removed to Summertown in 1873. Others include Headington School, Milham Ford School, and O. High School for Girls.

Before 1914 O. was regarded solely as a univ. city and mkt tn, printing being then its only considerable industry. Between the 2 wars the O. motor industry expanded rapidly, and the city's pop. rose from 67,000 in 1921 to 94,000 in 1938. By 1945 O. itself contained a pop. of 100,000. Extensive development has also taken place immediately outside its limits, so that the total pop. is really much larger. O., however, possesses few natural advantages for the location of heavy industry, and the success of the motor industry at Cowley must be attributed to the initiative and ability of its founder, Lord Nuffield. Unfortunately the only effective controls on building were those

exercised by the physical geography of the site, and the built-up areas now resemble the spokes of a wheel radiating from Carfax, and separated by the valleys of the Cherwell and the Thames. The old walled city was planned on its cramped site at the S. end of the gravel terrace between the 2 rivers, and is in striking contrast to the unplanned development of recent years. In 1945 the city council appointed Dr Thomas Sharp, president of the Tn Planning Institute, to prepare a master-plan for the future development of O., and his advice has been followed in a number of matters. To relieve the congestion caused by the heavy traffic which was compelled to pass through the centre of O., in Sept. 1956 the minister of housing and local gov., then Mr Duncan Sandys, proposed the building of a by-pass through Christ Church Meadow. There was considerable opposition to the scheme, and in Feb. 1957 the O. City Council announced that they were unwilling to accept the proposal or to submit plans.

Since 1885 the city has returned only 1 member to Parliament; before that date it sent 2. Under the univ. franchise (discontinued in 1948), O. Univ. returned 2 members. Pop. 101,500. See J. Ingram, *Memorials of Oxford*, 1837; C. W. Boase, *Oxford* (in *Historic Tns* series), 1887; G. Smith, *Oxford and the Colleges*, 1895; P. Dearmer, *The Cathedral Church of Oxford*, 1899; A. Laug, *Oxford*, 1916; J. Wells, *The Charm of Oxford*, 1920; J. Betjeman, *An Oxford University Chest*, 1938; T. Sharp, *Oxford Replanned*, 1948; W. J. Arkell, *Oxford Stone*, 1948; C. Hobhouse, *Oxford* (5th ed.), 1952; J. C. Masterman, *To Teach the Senators Wisdom*, 1952. See OXFORD UNIVERSITY.

Oxford and Asquith, Emma Alice Margaret, Countess of, née Tennant (1864-1945), b. Peeblesshire, sixth daughter of Sir Charles Tennant, a wealthy ironmaster, and a descendant of Robert Burns. Her autobiography, 2 vols., 1920-2, recording her vivid impressions of leading men and women, portrays her in her uninhibited youth as an exceedingly versatile and unconventional young woman, a gay talker, a dashing rider to hounds, a student of Plato, and an inveterate flirt. Later she became a conspicuous member of the brilliant Victorian group known as 'The Souls,' of whom Arthur James Balfour was the moving spirit. 'The Souls' were moved by an interest in things of the mind, as opposed to the ordinary frivolous interests of the hour. The romance of her life was her meeting with the rising politician, Herbert Asquith, and her marriage to him in 1894. As a writer hers was a personal success rather than a noteworthy literary achievement. The secret of her brilliant reputation lay partly in her good fortune, but still more in her vivid and vital personality. Her pubes., in addition to the famous *Autobiography of Maryot Asquith*, 1920-2, include *Places and Persons*, 1925, *Lay Sermons*, 1927, *Oriana*, 1928, *More Memories*, 1933, and *Off the Record*, 1944. She had 2 children, the Honourable Anthony Asquith, film producer, and a

daughter, Elizabeth (d. 1945), who married Prince Antoine Bibesco.

Oxford and Asquith, Herbert Henry, 1st Earl of (1852-1928), statesman, b. Morley, Yorks, and educ. at the Moravian School, Pudsey, the City of London School, and Balliol College, Oxford. He was called to the Bar after leaving Oxford, and quickly distinguished himself; he defended John Burns in 1887 in the case arising out of the riots in Trafalgar Square, and in 1889 he was junior counsel for the Irish Nationalist members in the Parnell case. In 1886 he became Liberal M.P. for E. Fife, a seat which he retained up to the year 1918. In 1892 he moved the vote of want of confidence which led to the fall of the Salisbury gov., and was rewarded by the office of home secretary in the Liberal Cabinet which was then formed. In 1877 he married Helen Melland, by whom he had 4 sons and 1 daughter. She d. in 1891, and in 1894 he married as his second wife Emma Alice Margaret (Margot) Tennant (see OXFORD AND ASQUITH, COUNTESS OF).

In the Boer War he was noted for rigid adherence to imperial ideas. But on the enunciation of the fiscal policy of Chamberlain, he led the movement which was to unite the Liberal party on economic grounds, and to sweep the country in 1906. In 1905, on the resignation of Balfour, he became chancellor of the exchequer in the Campbell-Bannerman gov., and soon became the most prominent man of the party. In April 1908, on the resignation of Campbell-Bannerman, he became Premier. In 1909, when the rejection of the budget by the Lords forced an election, he returned to attack, with the help of the Irish and the Labour members, the veto of the Lords. Following a general election, Nov. 1910, a Veto Bill was introduced and passed, after a threat of creation of peers had led to the withdrawal of the official opposition. In 1911 the Insurance Act was passed, and in 1912 Bills for the Better Gov. of Ireland and Welsh Disestablishment were introduced.

The dominating issue in politics in the years immediately preceding the First World War, while he was as yet Premier, was Irish Home Rule. Then came the historic Curragh incident (see CURRAGH INCIDENT). Seely, then war minister, resigned, and Asquith announced that he proposed to act as war minister himself. He handled the situation with tact and skill. Negotiations were now continued for finding some *via media* which would give S. Ireland Home Rule, and at the same time meet the objections of such parts of Ulster as were affected. In Mar. 1914 he announced his readiness to give to each Ulster co. the option of excluding itself from the Irish Parliament. Negotiations were still going on when this and every other question of internal politics became submerged in the cataclysm of the First World War and Asquith immediately resigned the war ministry to Kitchener, and devoted his energies to securing the solidarity of the country against the common enemy.

As a peace Prime Minister he had revealed great qualities as a debater, and much dexterity as a party leader. Put to the test of war he showed, at all events in the earlier months, none of the indecision which seemed at a later stage to characterise his policy towards the questions of conscription and the shell shortage. His early speeches were admirable expositions of the purposes for which the country was fighting. But by 1915 there were criticisms within the country and within the Cabinet itself on Asquith's war policy,



*Topical Press*

LORD OXFORD AND ASQUITH

which became concentrated on the lack of suitable munitions. The result was a coalition gov., formed in April 1915, and including Conservatives, with Asquith still Prime Minister. Then came the Irish rebellion of 1916. After the execution of the ringleaders, Asquith visited Ireland in the hope of laying the foundations for an honourable settlement. Negotiations were set on foot between the leaders of the opposed Irish factions, Lloyd George being the gov. intermediary. A compromise was reached, but soon afterwards wrecked through the influence of the Unionist wing of the coalition ministry. Among the Unionists at this time conviction was growing that if the war was to be won Asquith should be superseded. The first blow was dealt by Lloyd George by his proposal of a War Council, from which the Prime Minister should be excluded, an exclusion which he defended on the ground that the independence of opinion from party influence would thereby be secured. Asquith refused. Lloyd George retaliated by sending in his resignation. Then Bonar Law and the other Unionist members of the Cabinet gave

notice to the Premier that they were no longer willing to co-operate with him, and he was thus forced into resignation, and Lloyd George displaced him as Prime Minister (1916). This was really the end of Asquith's long and distinguished record as a minister of the Crown. Apart altogether from the Home Rule imbroglio, the true cause of his downfall was his real or fancied inability to handle the shell-shortage problem. Where Asquith failed Lloyd George succeeded. The munitions were forthcoming, if at a huge price to the nation, and the war was won. But the transfer of power from the leader to his lieutenant naturally brought with it the bitterest acrimony between their respective adherents, and the cleavage was never healed.

In the 1918 'khaki' election Asquith was defeated by a Conservative supporter of Lloyd George. Ultimately he was returned for Palsley. Back in the House he endeavoured unsuccessfully to undermine Lloyd George; but by 1923 a superficial reunion between the Asquith and Lloyd George liberals had been reached, with Asquith acknowledged as party leader. After the election of 1923 the Liberals, holding the balance between the Conservatives and the Socialists, helped the Socialists into power for the first time; but the brief 8 months' reign of Ramsay MacDonald's first gov. was followed by the return of a Conservative gov., with a tremendous majority. Asquith, though still Liberal leader, once again found himself without a seat. In Feb. 1925 he was raised to the Upper House, with the title of Earl of O. and A., and a few weeks later he was made a knight of the Garter. The assumption that differences between Lloyd George and Lord O. had been healed was dispelled during the general strike of 1926 when, after the collapse of the strike Lord O. charged Lloyd George with pursuing a policy of his own towards the strike uncountenanced by his colleagues. The Liberal press, however, supported Lloyd George.

In 1926 Lord O. resigned the Liberal leadership: but his influence on the party as a whole had by now been negligible for some time. He d. 2 years later. His *Memories and Reflections*, pub. a few months after his death, contain well-balanced comments on some of the great events in his long political experience and characteristically restrained observations on the men of his time. See official life by J. A. Spender and C. Asquith, 1932; and his *Letters to a Friend* (ed. D. McCarthy), 1931 and 1934.

Oxford and Cambridge Cup, trophy competed for annually by Australian univ. boat crews. It was presented in 1893 by 'old blues' of Oxford and Cambridge.

Oxford Breed, see SHEEP.

Oxford Clay, sub-group of the Oxfordian div. of the Upper Jurassic, consists of layers of stiff blue and brown clay. It stretches from Dorset, where it attains a thickness of about 800 ft, through Oxford to Yorks, where it is about 400 ft thick. The beds are very fossiliferous, yielding Ammonites (*A. Jason*, *A. Cordatus*, *A.*

*Duncani*, *A. Ornatus*), Belemnites (*B. Hastatus*), and abundant Lamellibranchs (*Gryphaea dilatata*, *Ostrea*, etc.). *Ammonites Cordatus* and *A. Jason* occur as zonal fossils. Gastropods and Brachiopods are found, but are not plentiful. Fishes (*Hypodus*, *Lepidotus*, etc.) and some reptilian genera (*Ichthyosaurus*, *Plesiosaurus*) have been found. In France the rocks are represented by the 'Oxfordien,' and they are found in Germany at the base of the 'White Jura.'

**Oxford Group**, name given in 1928 to the movement initiated in Oxford in 1921 by Dr Frank N. D. Buchman (q.v.), who defined it as 'a Christian revolution, whose aim is a new social order under the dictatorship of the Spirit of God, making for better human relationships, for unselfish co-operation, for cleaner business, cleaner politics, for the elimination of political, industrial, and racial antagonisms.' In 1939 the O. G. was incorporated in Britain (under the Companies' Act of 1929) as an association not for profit, whose object is 'the advancement of the Christian religion.' It has been similarly incorporated in America and elsewhere. These corporations provide the legal and administrative basis for the work of Moral Re-Armament (q.v.). Objections have been raised against the system by orthodox churchmen on the grounds that it ignores the intellectual and institutional side of Christianity, and that enthusiasm is no alternative for sound reasoning and sacramental grace. See **Oxford Group**, *The Oxford Group and its work of Moral Re-Armament*, 1954.

'**Oxford Magazine**,' founded in 1883 by T. H. Warren of Magdalen and R. Lodge of Brasenose. It is pub. weekly during university term by an editorial committee of senior members, and is devoted to news, comment, articles, and book reviews bearing on univ. affairs and matters of academic interest.

**Oxford Movement**, known also as the Tractarian Movement, and by its supporters as the Catholic Revival, was an attempt to make members of the Church of England realise the primitive and Catholic principles on which the O. M. believed it depended. Its proximate cause was the gov.'s abolition of 10 Irish bishoprics in 1833, which caused many to ask on what the Church could rest if attacked by the gov. The reply came from Oxford in the insistence on the divine mission of the Church as the extension of the Incarnation. Newman dates the commencement of the movement from Keble's sermon at St Mary's, Oxford, on 14 July 1833. In the same year began the pub. of the *Tracts for the Times*. In 1834 Pusey gave the movement the weight of his learning and influence. Other names prominent in the origination of the movement were those of Newman and Froude. The *Tracts* evoked a storm of opposition, and many of the original leaders seceded to the Church of Rome. The events of this period may be studied in Newman's *Apologia* and Liddon's *Life of Pusey*. But the movement continued with increased vigour, and by the begin-

ning of the 20th cent. had transformed the face of the whole Anglican communion. It has promoted home and foreign missions, frequent services, a high standard of clerical life, and reverent ceremonial. See also **ENGLAND**, **CHURCH OF** and **RITUALISTS**. There are many books on the subject. See R. W. Church, *The Oxford Movement*, 1891; W. Walsh, *Secret History of the Oxford Movement* (5th ed.), 1898 (written from the point of view of an opponent of the movement); H. R. T. Brandreth, *Oecumenical Ideals of the Oxford Movement*, 1947.

**Oxford Sheep**, see **SHEEP**.

**Oxford Street**, famous London thoroughfare, a noted shopping centre, and forming the boundary between the city of Westminster and the bor. of St Marylebone. It follows the site of the Rom. road that ran from London to Silchester, and has been known at different times as 'the way from Uxbridge,' 'the road to Oxford,' and 'Tyburn road,' being the road to the famous gallows (see **TYBURN**). It was eventually named after Edward Harley, 2nd Earl of Oxford, who married the daughter of the Duke of Newcastle, who owned land in St Marylebone. It is crossed midway by Regent Street (q.v.). The Pantheon, a fashionable entertainment centre, stood near the E. end of the street from 1772 until closed in 1867. The E. extension, known as New O. Street, was added in 1847.

**Oxford University**. The beginnings of teaching at Oxford can be carried back as far as the early years of the 12th cent., when we read that it was the seat at which Theobald of Etampes gave instruction (c. 1115). As a corporate body the University probably took its rise towards the end of that cent. or the beginning of the 13th. After a number of earlier instruments, the position of the University is now effectively governed by the Universities of Oxford and Cambridge Act, 1923, under which a Statutory Commission was set up for Oxford, and many new statutes were made for the University and colleges. The University is a corporation consisting of masters and scholars united under the chancellor. The undergraduates and bachelors of arts have no voice in the gov. of the University, which rests with the senior graduates. Ordinary University business, including, especially, taking the initiative in considering and submitting to the Congregation of the University all University legislation, is carried on by the Hebdomadal Council, which was instituted in 1631 and consists of the chancellor, the vice-chancellor, a pro-vice-chancellor and the 2 proctors (all *ex officio*), and 18 other members, 6 elected by Congregation every 2 years for 6 years. Council's powers are limited because most of its decisions have to be ratified by Congregation (though ratification is often formal); and many parts of the University (e.g. Bodleian Library, Ashmolean Museum), though financed by the University, are managed by bodies which in their routine administration are largely independent of Council. Congregation (roughly, all the resident M.A.s

and persons holding higher degrees, numbering about 1200) amends if necessary and ratifies legislation submitted by Council, and has considerable powers in the election of the administrative bodies of the University. The Convocation of the University (roughly all M.A.s and persons holding higher degrees, whether resident or not, numbering nearly 20,000) now has few powers, including the election of the chancellor and the conferment of honorary degrees. The Auct House of Congregation was once concerned with

(Responsions) or have gained exemption. Among the scholarships offered are the Rhodes scholarships, founded in 1902 by Cecil John Rhodes and awarded to students from the Commonwealth and America. The Bodleian Library, founded in 1602, is also the general library of the University and contains about 2,000,000 vols. and about 50,000 MSS. There are also a number of departmental and college libraries. The relations between the University and colleges are intimate, all members of the colleges being members



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THE SHELDONIAN THEATRE, OXFORD

education and discipline, but now has practically no other function than that of granting degrees. Its former functions were lost under an act of 1854, which created Congregation. Ceremonial functions of the University, which until 1669 were held in St Mary's Church, are held in the Sheldonian Theatre (built by Wren, 1669). The University possesses faculties in theology, law, medicine, *literae humaniores*, modern history, Eng. language and literature, medieval and modern languages, oriental studies, physical sciences (including mathematics), biological sciences, social studies, anthropology and geography, music, and agriculture and forestry. The University awards the usual degrees and diplomas and admits both men and women who have passed the entrance examinations

of the University, but the college corporate bodies are different from the University and manage their own property. Regent's Park College and Greyfriars were recognised in 1957. See ALL SOULS, BALIOL, BRASENORSE, CAMPION HALL, CHRIST CHURCH, CORPUS CHRISTI, EXETER, HERTFORD, JESUS, KEBLE, LINCOLN, MAGDALEN, MANSFIELD, MERTON, NEW, ORIEL, PEMBROKE, QUEEN'S, ST ANTHONY'S, ST BENET'S HALL, ST CATHERINE'S SOCIETY, ST EDMUND HALL, ST JOHN'S, ST PETER'S HALL, TRINITY, UNIVERSITY, WADHAM, and WORCESTER, which are men's colleges, and LADY MARGARET HALL, ST ANNE'S, ST HILDA'S, ST HUGH'S, and SOMERVILLE, which are women's colleges; also NUFFIELD COLLEGE. In 1958 there were about 8600 undergraduates. See Sir C. Mallet,

*History of the University of Oxford*, 1924; A. Flexner, *Universities: American, English, German*, 1930; J. A. R. Marriott, *Oxford: its Place in National History*, 1933; L. H. D. Buxton and S. Gibson, *Oxford University Ceremonies*, 1935; C. Hobhouse, *Oxford*, 1952; *The Victoria History of the County of Oxford*, vol. iii (The University of Oxford), 1954; *Oxford University Handbook* (ann.).

**Oxford University Press**, dept of the univ. wholly owned by 'the Chancellor, Masters, and Scholars,' and by far the largest institution of its kind in the world. It receives no grant from the univ., or from any other source, but is self-supporting, the profits being employed both as a source for working capital and to finance the pub. of learned works. It is governed by a univ. committee, the Delegates of the Press. Its prin. depts are (1) the publishing office at Oxford, responsible for the learned and educational books bearing the imprint 'At the Clarendon Press' (q.v.); (2) the printing works, also at Oxford; (3) the publishing dept in London, whose functions have for long included, in addition to the distribution of Clarendon Press books and Oxford Bibles and prayer books, the production of certain classes of books of a less strictly academic character (e.g. the World's Classics series, q.v.), and conveniently differentiated by the more general imprint 'Oxford University Press.'

The first Oxford book is believed to have been printed in 1478 (though the date on the title-page is 1468), but the continuous hist. of the press does not begin until 1585. Many notable works of learning were issued during the next 300 years, and a period of great expansion began towards the close of the 19th cent., coinciding with the growth of public education. The most widely known Oxford books are no doubt the Bibles and prayer books, and the dictionaries and reference books, notably the great *Oxford English Dictionary*, begun in 1884 and completed in 1928, and the *Dictionary of National Biography*, handed over to the delegates by its original publishers, Messrs Smith, Elder, in 1917.

**Oxfordshire**, or Oxon, midland co. of England, bounded on the S. by the R. Thames and Berks, E. by Bucks, NE. and NW. by Northants and Warwickshire, and W. by Glos. The surface is varied: the greater part of the co. lies in the Thames basin, but in the N. there are stretches of downs, while the S. is hilly, the greatest elevations being reached in the Chiltern Hills. Part of Wychwood Forest, disafforested in 1862, is found in the W. The chief riv. is the Thames, with its tribs., the Windrush, Evenlode, Cherwell, and Thame, none of which rises in the co. The scenery in the Thames valley is extremely beautiful, and includes many favourite riv. resorts: Henley, Goring, etc. The soil is good, and agriculture flourishes; the main crops are barley, oats, and wheat, while beans and turnips are also grown. Farming in all its branches is carried on, and cattle, sheep, and pigs are reared. Some iron ore is raised, and brickmaking is an

important industry. The chief manufs. are motor vehicles at Cowley, blankets at Witney, gloves at Woodstock, agric. implements and engines at Banbury (which is also famous for a certain kind of cake), with tweed, lace, and paper mills. The co. is served by the W. Region railway, and also by a branch of the Midland Region from Bleicester to Oxford. The co. includes 14 hundreds, and 2 parl. divs., each returning 1 member. The Roll-right Stones and the Devil's Quits at Stanton Harcourt are well-known prehistoric monuments. Oxford was the chief stronghold of the Royalists throughout the Civil war (1642-6), and was the scene of many engagements. Few of the old castles remain, the most notable being those of Oxford, Shirburn, and Bampton, while there are remains of such celebrated mansions as Minster Lovell, Greys Court, and Rycote. At Woodstock is Blenheim Palace (q.v.). Of all the monastic buildings that were the natural outcome of the close proximity of the univ. but few remain, the abbey church at Dorchester being the most important. There are a number of beautiful churches, besides those in Oxford (q.v.) itself, including those of Iffley, Adderbury, and Minster Lovell. Area 768 sq. m.: pop. 244,600. See *The Victoria History of the County of Oxford* (5 vols.), 1904-57; A. Mee, *Oxfordshire*, 1942; R. Turner, *Oxfordshire*, 1949; Joanna Cannan, *Oxfordshire*, 1952.

**Oxidation**, chemical process whereby substances take up or combine with oxygen, as, for example, when magnesium burns in air  $2\text{Mg} + \text{O}_2 = 2\text{MgO}$ . A substance containing hydrogen can sometimes lose some or all of it in the form of water when oxidised. Thus alcohol,  $\text{C}_2\text{H}_5\text{O}$ , is oxidised to acetaldehyde,  $\text{CH}_3\text{CHO}$ , by the oxygen-giving mixture of potassium dichromate and sulphuric acid. Further  $\text{O}$ , by the addition of oxygen, produces acetic acid,  $\text{CH}_3\text{COOH}$ . Thus the result of  $\text{O}$  may be either an increase of oxygen or a decrease of hydrogen. Extending the term, we may say that the addition of a negative element or radicle is a process of  $\text{O}$ , whereby a compound corresponding to a higher degree of  $\text{O}$  is obtained, e.g.  $2\text{FeCl}_2 + \text{Cl}_2 = 2\text{FeCl}_3$  (see OXYGEN). Ferrous chloride is derived from ferrous oxide,  $\text{FeO}$ , and ferric chloride from ferric oxide,  $\text{Fe}_2\text{O}_3$ . Thus  $\text{O}$  sometimes involves valency increase.

**Oxide Paint**, paint in which the colour of the pigment is due entirely to inorganic iron compounds. The pigments mix well, are inert and permanent, and vary in colour from dark red to black through purple. They are chiefly used in external painting, in an oil medium.

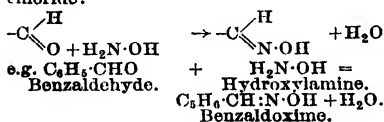
**Oxides** are binary compounds formed by the union of elements with oxygen. They may be divided into 7 classes: (1) basic  $\text{O}$ , (2) acidic  $\text{O}$ , (3) neutral  $\text{O}$ , (4) amphoteric  $\text{O}$ , (5) sub  $\text{O}$ , (6) higher  $\text{O}$ , (7) composite  $\text{O}$ . Basic  $\text{O}$  are the  $\text{O}$  of metallic elements which react with acids to form salts and water, e.g.  $\text{CaO} + 2\text{HCl} = \text{CaCl}_2 + \text{H}_2\text{O}$ . Acidic  $\text{O}$  are the  $\text{O}$  of non-metallic elements which react with bases to form salts and water, e.g.



$\text{SO}_3 + 2\text{NaOH} = \text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$ . Some, but not all, of the acidic O. dissolve in water to form acids. Neutral O. are O. which are neither acidic nor basic, e.g. nitrous oxide ( $\text{N}_2\text{O}$ ), carbon monoxide ( $\text{CO}$ ). Amphoteric O. are O. of elements which are neither truly metallic nor truly non-metallic and which behave either as a basic O. or as an acidic O. under appropriate conditions, e.g.  $\text{ZnO} + \text{H}_2\text{SO}_4 = \text{ZnSO}_4 + \text{H}_2\text{O}$ ;  $\text{ZnO} + 2\text{NaOH} = \text{Na}_2\text{ZnO}_2 (\text{Na zincate}) + \text{H}_2\text{O}$ . According to the modern theory of acids and bases water is an amphoteric O. since it gives hydrogen ions (acidic) and hydroxyl ions (basic), viz.:  $\text{H}_2\text{O} \rightleftharpoons \text{H}^+ + \text{OH}^-$ . Sub O. are O. of metals or non-metals which contain less oxygen than the normal O. in which the element shows its normal valency, e.g. lead suboxide,  $\text{Pb}_2\text{O}$ . Higher O. are O. which possess more oxygen than the normal O. They include the peroxides which liberate hydrogen peroxide on treatment with a dilute acid, e.g.  $\text{BaO}_2$  and dioxides which do not liberate hydrogen peroxide in this way, e.g.  $\text{MnO}_2$ . Composite O. are O. of metals that react chemically as though they were mixtures of 2 O. of the same metal. These O. are not, however, mechanical mixtures of the 2 O., e.g. red lead,  $\text{Pb}_3\text{O}_4$ , behaves as  $2\text{PbO} \cdot \text{PbO}_2$ , and on treatment with nitric acid forms lead nitrate from the  $\text{PbO}$  part and leaves  $\text{PbO}_2$  as a brown residue. The above classification is not a hard and fast one.

#### Oxides, Alkyl, see ETHERS.

Oximes are compounds derived from the aldehydes (q.v.) and ketones (q.v.) by replacing the oxygen atom of the  $-\text{CHO}$  or  $>\text{CO}$  group by the radical  $>\text{N} \cdot \text{OH}$ . This replacement is usually effected by acting on an alkaline aqueous solution or suspension of the aldehyde or ketone with hydroxylamine hydrochloride,  $\text{NH}_2\text{OH} \cdot \text{HCl}$ , the alkali serving to liberate free hydroxylamine from the hydrochloride:



The O. are usually beautifully crystalline compounds, and are used in the separation and purification of the aldehydes and ketones. They are also of considerable interest from the point of view of stereoisomerism (q.v.).

**Oxlip** (*Primula elatior*), handsome plant with a very limited distribution in the E. cos. of England. It is intermediate in character between the primrose and the crowslip, but may be distinguished from the rather common hybrid between these 2 plants by the absence of folds in the throat.

#### Oxon, see OXFORDSHIRE.

**Oxted**, tn and par. of Surrey, England, in Godstone (q.v.) rural dist. O. has a church founded in the 13th cent., a 15th-cent. inn, and many old houses. Pop. 3799.

#### Oxus, see AMU-DAR'YA.

#### Oxy-acetylene Welding, see WELDING.

**Oxychlorides** are compounds which may be looked on as being intermediate between oxides and normal chlorides. Their formation is generally brought about by the addition of excess of water to the chlorides, but only a few metals form O., and the compound is not easily prepared pure or of definite chemical composition. (Non-metals such as phosphorus form O., e.g.  $\text{POCl}_3$ .) The O. may be regarded as basic chlorides, or rather as the anhydrides of such, e.g. bismuth O. ( $\text{BiOCl}$ ) may be regarded as the anhydride of the basic bismuth chloride.

#### Oxycoccus, see CRANBERRY.

**Oxygen** (symbol O; atomic number 8; atomic weight 16.00, standard; valency 2, and sometimes 4, in oxonium compounds, q.v.), is the most abundant and important element. It forms 23 per cent by weight of air, 89 per cent of water, and about a half of all the rocks which comprise the crust of the earth. It was discovered by Scheele (1771), but the discovery was not pub. until after Priestley (1774) had described its preparation from mercuric oxide. The gas is produced on the small scale by the decomposition of potassium chlorate. This is heated either alone or with a catalytic agent such as manganese dioxide. Thus  $2\text{KClO}_3 = 2\text{KCl} + 3\text{O}_2$ . On heating manganese dioxide to bright redness, O. is evolved,  $3\text{MnO}_2 = \text{Mn}_3\text{O}_4 + \text{O}_2$ . The gas may also be obtained by the action of sulphuric acid upon the dichromate or permanganate of potassium; by the action of heat on many oxides and O.-containing compounds (e.g. nitrates); by the action of strong sulphuric acid on peroxides; bleaching powder with a catalyst (cobalt oxide); sodium peroxide on water; hydrogen peroxide and manganese dioxide; and many other reactions. The O. made on the commercial scale is now obtained by the distillation of liquid air (q.v.) and as a by-product in some electrolytic operations. O. is a colourless gas, tasteless, odourless, and slightly heavier than air. One litre of the gas weighs 1.429 gm. at standard temp. and pressure. It is slightly soluble in water (1 c.c. of water dissolving 0.0489 c.c. of O. at 0° C. and 760 mm.), and also in molten silver, which absorbs about 20 times its own volume of the gas. The critical temp. of the gas is  $-118.8^\circ$ , at which point a pressure of 58 atmospheres is required to cause its liquefaction. Liquid O. is a pale steel-blue liquid which boils at  $-182.5^\circ$ , at which temp. its sp. gr. is 1.1315. The liquid is strongly magnetic. The gas is endowed with very powerful chemical affinities, combining with iron, phosphorus, sodium, and potassium at ordinary temps., i.e. the metals are oxidised. The process of oxidation may proceed so rapidly as to cause the metal or body to burn. Thus oxidation accompanied by light and heat is known as combustion. Many substances, not usually regarded as combustible, will burn in O. if the temp. be raised sufficiently. Thus steel wires will burn with rapidity and brilliancy if heated strongly

thousands are tinned and shipped to interior parts. The S. states get their O.s mainly from the Gulf of Mexico. As the beds are free from the diseases and parasites that have attacked the Brit. beds, the Amer. O. is very much cheaper. The Pinnadae are a family, with genera *Pinna* (fan-shells) and *Lima*, nearly related to the O. They are found chiefly in the Mediterranean, where they sometimes attain a length of over 2 ft. Fresh-water O.s (*Unio*), found in rivs. in America, are cultivated for the shells used in button-making. See J. R. Philpots, *Oysters and all about them*, 1890; J. Hornell, *Oyster Beds of Sind*, 1910; J. H. Orton, *Oyster Biology and Oyster Culture*, 1937; P. S. Galtsoff, *The Oyster Industry of the World*, 1951.

**Oyster Bay**, harbour, tn, and summer resort of Nassau co., New York, U.S.A., on the N. coast of Long Is. It is a terminus of the Long Is. railroad, and is, in addition, a favourite seaside resort and summer residence. O. B. is well known as the home of Theodore Roosevelt, who is buried near by. Pop. 42,594.



OYSTER-CATCHER

**Oyster-catcher**, Mussel-picker, or Sea Pie (*Haematopus ostralegus*), common bird on Brit. shores, though it often goes up rivs. many miles inland to breed; it may nest in Scotland at a height of over 1500 ft. The nest is usually a rough structure without lining. In it are laid 3 or 4 large eggs of a buff or stone colour, blotched with dark brown or black. Both sexes appear to share the duties of incubation. The young in their pretty, thick down are able to run about when only a few hours old, and in 5 or 6 weeks are able to fly. By the end of July the birds congregate in large flocks on the coast. The long bill is perfectly adapted for forcing open the shells of molluscs, but both marine and terrestrial worms and insects are also consumed. The birds are about 16 in. long; the head, neck, and upper parts are black, and the under parts white, but pure white specimens occasionally occur in large flocks.

**Oyster Plant**, see SALSIFY.

**Oystermouth**, see MUMBLES.

**Ozanam, Antoine Frédéric** (1813-53), Fr. scholar, b. Milan, and educ. at Lyons. Whilst studying law in Paris he associated with Chateaubriand and Montalembert, and became, with them, a champion of the Catholic revival. From 1840 onward he was prof. of foreign literature at the Sorbonne. His chief writings are *Dante et la philosophie catholique au XIII<sup>ème</sup> siècle*, 1839, and *Études germaniques*, 1847-9. See study by H. Auer, 1933.

**Ozark Mountains**, range of highlands, altitude generally 1000-1200 ft, which, beginning from the Missouri R., extend in a SW. direction almost to the Arkansas R. They traverse chiefly the states of Missouri and Oklahoma, but also cross S. Illinois and the NW. of Arkansas. Area approximately 60,000 sq. m.

**Ozokerite**, a wax composed of paraffin hydrocarbons, in consistency like spermaceti, occurring naturally in parts of Europe and the U.S.A. in association with coal. The colour varies from the white of the pure substance to green and yellowish-brown, and often shows a greenish opalescence. It melts at about 63° C. and is lighter than water. The impure solid found in Galicia and Rumania is purified by treatment with concentrated sulphuric acid and distillation. Original O. from Moldavia is soluble in ether, giving a yellow solution. The wax is used for making candles, sealing wax, paints, polishes, and insulating material.

**Ozone**, allotropic form of oxygen found in very small quantities in the lower atmosphere but in considerable quantities at a height of 30 m. above sea level. O. is formed out of the oxygen of the air by an electrical machine in operation, and when lightning discharges occur; it is also found in the oxygen prepared from the electrolysis of water. Varying quantities of the gas are obtained during many processes of slow oxidation at ordinary temps., e.g. oxidation of phosphorus in air. During the combustion of ether on red-hot platinum, a considerable amount of O. is formed. The gas is best obtained by exposing pure dry oxygen to the influence of the silent electric discharge. A simple apparatus for this purpose consists of a straight piece of narrow glass tube, containing a straight platinum wire inside which passes through the walls of the tube at one end and is there sealed into the glass. A second wire is wound round the outside of the tube. On connecting the end of the outer wire and the free end of the platinum wire to the terminals of an induction coil and passing a slow stream of oxygen through the tube, the issuing gas is found to be highly charged with O. O., as prepared above, is always mixed with excess of oxygen (80 per cent or more), and even in this diluted state it has a strong unpleasant smell which induces headache, and it has an irritating effect on the mucous membrane. The gas is slightly soluble in water, 4.5 c.c. dissolving in 1000 c.c. of water. It condenses to an intensely deep blue liquid which boils at -112° C., and is a very explosive substance. O. is a powerful oxidiser; it attacks and destroys organic matter,

indiarubber being quickly rotted through by its action. It decolorises vegetable colours, and acts at once upon most metals, silver and mercury being converted into oxides. Sulphides are converted into sulphates, and the gas also liberates iodine from potassium iodide. This latter constitutes a rough test for the presence of the gas, the liberated iodine forming a blue compound with starch solution. From the observation that 2 volumes of O. when heated to  $250^{\circ}$  C. are transformed to 3 volumes of oxygen, the difference between this latter gas and its allotrope is explained by giving O. the formula  $O_3$ , i.e. it contains 3 atoms to the molecule, whereas the oxygen

molecule only contains 2 atoms. If this be the case then, since the molar weight of oxygen = 32, that of O. will be 48. This is confirmed by the rate of its diffusion, which is proportionately slower according to Graham's law. The O. present in sea air is supposed to explain its bracing effects. The gas is employed for purifying drinking water, for bleaching purposes, and for thickening oil. It has also been used for freshening the atmosphere in underground railways (e.g. in London). On the large scale it is prepared by suitable modifications of the electrical process described above.

**Ozothamnus**, genus now included in *Helichrysum* (q.v.).



**P**, sixteenth letter of the Eng. and other W. European alphabets, descended, through the medium of the Gk. Etruscan, and Lat. alphabets, from the N. Semitic *pe*, meaning 'mouth,' but it is unlikely (although many eminent scholars still hold such an opinion) that it represented in its original form a mouth. Indeed, the original name seems to have been chosen independently of the form of the letter, which was 4 or 7 (the script being from right to left).

**P** is the thin letter of the labial series (*p, b, f, v*) and is interchangeable with the other letters of the series. **P**, in Sanskrit, Greek, and Latin, is replaced by *f* in the Germanic tongues (see *f*). Words beginning with *p* in English and its kindred Germanic tongues are almost all of foreign origin (Slavic, Celtic, Latin), as *pain* (Fr. *peine*, Lat. *poena*), *plough* (Polish *plug*, *pil* (Lat. *puleus*, a well). The Gk preposition *apo* (Sanskrit *apa*) became in Latin *ab*; Gk *hupo*, Lat. *sub*; Sanskrit *upa*, Lat. *ob*; but before sharp letters, as *t* and *s*, the original *p* was retained in pronunciation, as is shown by inscriptions (*apstulit, optinui*). There are remarkable interchanges of *p* with the sharp guttural *k* or *q* (see INDO-EUROPEAN LANGUAGES, where the subdivisions into P-group and Q-group are mentioned). Thus for Lat. *quis, quod, quam*, the Oscan dialect had *pis, pod, pam*; Lat. *equus, coquo*, corresponded to Gk *hippos* (Aeolian *hikkos*), *pepo*; similarly Gaelic *mac* (son), *ceathair* (Lat. *quatuor*, four), *coig* (Lat. *quinque*, five), correspond to Welsh *map, pedwar* (Gk *pettores*), *pump* (Gk *pente* or *pempe*). In Greek *p* is sometimes replaced by *t*, as *tis, tessares*, for *pis, pettores*. In such words as *redemption, consumption*, *p* has been introduced as an intermediary between the incompatible sounds *m* and *t*. The initial *p* of Lat. words has for the most part passed into French unaltered; in other positions *p* has become *v*; thus Fr. *évoque, cheveu, décevoir, pauvre*, from Lat. *episcopus, capillus, decipere, pauper*. See ALPHABET.

**Paan** (also *Patang*), tn. in the prov. of Szechwan, China. At P. the bed of the Yangtze R. is nearly 10,000 ft above sea-level. A motor road from P. to Chengtu was built in 1955.

**Pearl**, or **The Pearl**: 1. Dist. of Cape prov. of S. Africa, noted particularly for its vineyards.

2. Main tn of the P. dist., situated 36 m. N.E. of Cape Town. Some of S. Africa's best wines are produced here, and the largest wine cellars in the world, those of the KWV (Ko-operative Wijnbouwers Vereniging), are at P. It derives its name from 3 gigantic boulders, which dominate the tn, and from where there are magnificent views. There are large jam and canning factories, flour mills, and light industries. Pop.: Whites, 12,700; Coloured, 15,295; Bantu, 2538.

**Paasikivi, Juho Kusti** (1870-1956),

Finnish economist and statesman, who headed the Finnish delegation at the conclusion of the peace with Russia at Tartu in 1920. He negotiated later on many occasions for Finland with the Soviet Union, notably in Moscow, 1939, before the attack and in 1940 at the conclusion of the Winter War; Prime Minister, 1944-6, when he was elected President of Finland. He was re-elected in 1950 for a period of 6 years.

**Pabianice**, tn of Poland, in Łódź prov., 8 m. SW. of Łódź (q.v.). It has textile, chemical, and machinery manufs. Pop. 37,500.

**Paca**, S. Amer. rodent mammals in the family to which the agoutis belong. There are only 2 species; these differ from the agoutis in having 5 digits on all the limbs in opposition to the 3 digits of their allies. The animals are remarkable for a curious structural peculiarity in the skull, the jugal arch being greatly developed and almost concealing the lower jaw. *Cuniculus paca*, the spotted cavy, is one of the largest of rodents, measuring about 2 ft in length, 14 in. in height; the body is covered with short, stiff, wiry hairs, and the tail is greatly reduced. It is nocturnal and vegetarian, lives in a superficial burrow in forests near water, the female produces a single young one at a birth, and the flesh is much sought after as food.

**Pacaraima Sierra**, range of mts in the Guiana Highlands, in lat. 4° N., and extending from W. to E. for over 500 m. They form a watershed between the basins of the Orinoco and Rio Branco R.s. and also between Venezuela and Brazil. Highest peak, Mt Roraima (9219 ft).

**Pacasmayo**, tn and port of Peru, in the dept of La Libertad, 65 m. N. of Salaverry. Connected by rail with Guadalupe and Chilote, P. exports rice, silver and copper, sugar, cotton, and hides. It has an airport. Pop. 7000.

**Paccard, Michel Gabriel** (1756-1827), Fr. physician and mountaineer, b. Chamonix, Haute Savoie. Between 1783 and 1786 he made many exploratory climbs on Mont Blanc (q.v.), 15,782 ft, which led to his discovery of a practicable route. With Jacques Balmat as porter, he made the first ascent by way of the Grand Plateau on 8 Aug. 1786. P. not only discovered the route but was throughout the driving force and leader. A handsome reward offered for the first ascent by the Genevese scientist, Horace Benedict de Saussure, went to Balmat through a misrepresentation of facts.

**Pacchiarotto, Jacopo** (1474-c. 1540), It. painter, b. Siena. From 1530 to 1535 he was concerned in conspiracies against the gov., and was compelled to flee into hiding in France. In 1539 he was exiled, but was allowed to return to Italy in 1540, the supposed year of his death. An 'Ascension' in the Siena Academy is

among the few existing authentic works accredited to him.

**Pace**, measure of length, derived from the Lat. *passus*. The latter, however, was measured from the heel-mark of one foot to the mark where it next touched the ground, thus equalling in the modern sense of the word 2 paces. The Lat. *passus* was a little less than 5 ft; a thousand of them went to a Rom. mile.

**Pacelli**, Eugenio, *see* PIUS (popes), *Pius XII*.

**Pacha**, *see* PASHA.

**Pachacamac**, anct city of Peru, near the point where the Lurin valley reaches the coast, 12 m. from Lima, the site of which has been excavated by Pennsylvania Univ. The Incas (q.v.) adopted the earlier god P. as a god of earthquakes. To the Yuncas P. was a creator-god, and the tn was sacred and had a great pyramidal temple; it remained a sacred city under the Incas.

**Pacheco**, Francisco (1571-1654), Sp. painter, b. Seville. In 1611 he visited Madrid, and eventually opened a school of painting in Seville. Among his pupils here was Velázquez, who married his daughter. The latter part of his life was spent in literary work, chiefly on the subject of painting. Some of his best paintings are at Madrid and Seville.

**Pachelbel**, Johann (1653-1706), Ger. organist and composer, b. Nuremberg, pupil of Kerl, held organist's posts at various places until 1695, when he was appointed to St Sebaldus Church in his native town. He wrote suites, fugues, and other works, and is especially important for his variations on hymn-tunes for the organ, which directly influenced the chorale preludes of J. S. Bach.

**Pacher**, Michael (c. 1430-98), Ger. painter and wood sculptor, b. Neustift. He travelled to Italy, but beyond an interest in perspective he acquired little of the Renaissance learning in art. He is of importance as one of the late Gothic artists, master of the altarpiece in which architecture, sculpture, and painting were combined.

**Pachmann**, Vladimir de (1848-1933), Russian pianist, b. Odessa. His musical education was obtained in Vienna, and on returning to Russia in 1869 he continued his studies, beginning public performances in 1875. He was famous as a player of Chopin's music and received the Royal Philharmonic Society's medal, 1916.

**Pachmarhi**, tn and hill station of the Deccan, in Madhya Pradesh State, India, on the Mahadeo range, at an altitude of 3500 ft. It was the summer seat of gov. for the Central Provs. Pop. 6700.

**Pachomius**, *see* MONASTICISM.

**Pachuca**, cap. of the state of Hidalgo, central Mexico, 62 m. by road NE. of Mexico city. In the vicinity are silver mines of great antiquity, yielding at the present time a considerable quantity of ore. The surrounding hills are honey-combed with old workings. Three railways and a good motor road lead to Mexico city. Buildings of the Sp. colonial period include Las Casas (1670), now used as offices; Las Casas Coloradas (1785),

now courts of justice; and a former Franciscan convent (1596). It has a fine modern theatre, and another modern building is the Bank of Hidalgo. Pop. 54,000.

**Pachydermata**, classification of mammals, founded by Cuvier for a number of thick-skinned, non-ruminant, hoofed animals, e.g. elephant and hippopotamus. It has now been superseded.

**Pacific Affairs**, Institute of, unofficial non-sectarian, non-controversial organization which aims at the improvement of the relations between the peoples of the Pacific area. It is directed by a Pacific Council, on which each of its constituent national units elects a member. The countries represented before the Second World War were the U.S.A., Japan, China, Hawaii, Australia, Canada, and New Zealand. It has a permanent secretariat, with H.Q. in Honolulu, which is responsible for the preparation and conduct of conferences and the promotion of research. It derives its support from research foundations and private contributions. The origin of the I. P. A. is traced to a group of business and professional men in Hawaii, and the proposal that representatives of the various peoples around the Pacific should meet and exchange views was carried out in the first conference, which met at Honolulu in 1925. Many conferences have been held since then and the proceedings pub. by the Univ. of Chicago Press. Many painstaking books on different topics have been pub. by members under the aegis of the institute, which, however, is not responsible for the opinions expressed in them. The I. P. A. series of monographs by various authors includes among the most recent K. Pelzer, *Katrine Greene*, J. D. Phillips, and Kate L. Mitchell, *Economic Survey of the Pacific Area*, 1942. Its periodical, *Pacific Affairs*, is pub. in the U.S.A.

**Pacific Campaigns**, or **Far Eastern Front**, in Second World War. *Japanese Invasion of the Southern Pacific and Eastern Asia*. By 1941 it was evident that the more moderate elements in the Jap. Gov. had been reduced to impotence by the military party (*see* JAPAN, *History*). Allied diplomatic circles considered, however, that Japan's military and financial resources were too deeply committed in China to permit her to attempt further military adventures elsewhere. Colour was lent to this belief by the 'negotiations' which were being ostentatiously conducted at Washington by Adm. Nomura and Mr Kurosu to settle Amer.-Jap. relations. In the midst of these bogus negotiations the Jap., without any formal declaration of war, swept down with their bombers and two-man submarines on Pearl Harbor (q.v.) (Hawaii) and other Amer. bases in the Pacific, and sank a Brit. gunboat in Shanghai (7 Dec. 1941). Within a day or two, apart from the severe damage in Pearl Harbour, Jap. bombers damaged the smaller Amer. bases at Wake Is. and Midway Is., attacked the Nauru Is. (Australian mandated ter.), bombed Guam (U.S. ter.), Hong Kong, the Philippines and other Is.,

and attacked Sarawak and Borneo. At the same time Jap. troops landed in NE. Malaya. Thailand (Siam) surrendered at once and granted passage to Jap. forces landing in the S. It was obvious from the widespread nature of these attacks and their thoroughness that Japan had been preparing the blow for sev. months or even years. Britain and the U.S.A. then formally declared war on Japan.

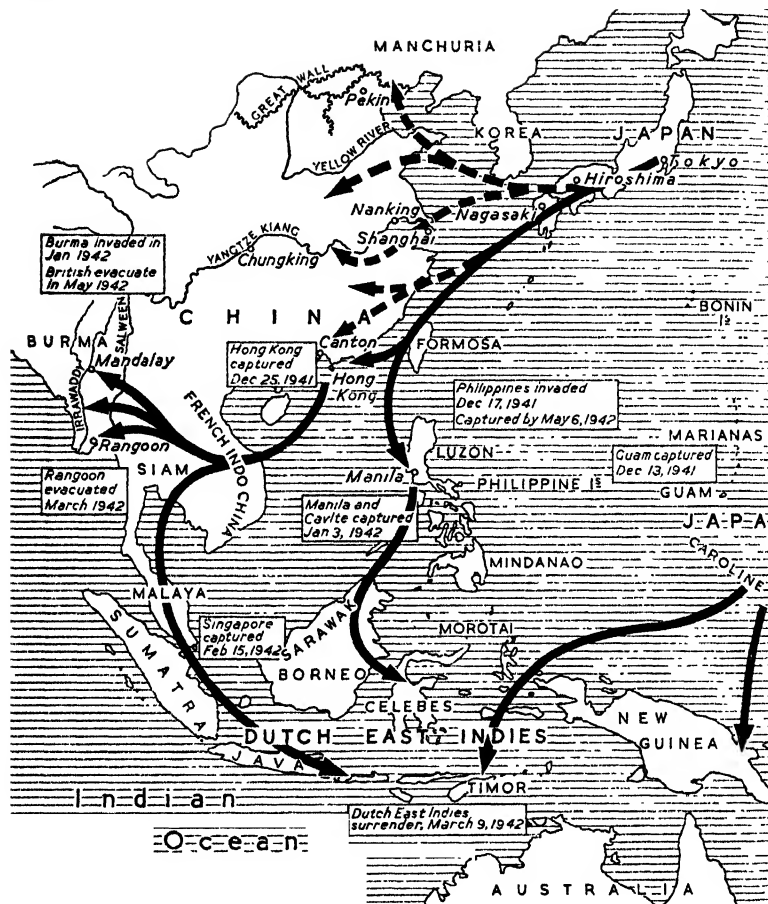
The hist. of the first few months' campaigns, following Japan's entry into the war, was one of futile bravery on the part of the allied forces against overwhelming odds. The crux of the whole situation was sea-power, and the Jap. Navy was in control at the very outset. The Amer. Navy had suffered at Pearl Harbor and in the loss of Guam and Wake Is. the worst blows in its hist. As early in the campaign as 10 Dec., Britain lost the great new battleship, *Prince of Wales*, and the *Kepulse*, bombed and torpedoed by 60 Jap. bombers and 27 torpedo-carrying planes, while engaged in operations against Jap. landings off the Malayan coast, a hopeless if gallant mission, since the ships had no aircraft protection. In quick succession the Jap. overran most of the Philippines, subjecting the open city of Manila to merciless and indiscriminate bombing, seized Hong Kong, swept over the Malaya Peninsula and captured Singapore, prin. bastion and base of the allied nations in the Far E., and reduced one by one various strategic points in the Netherlands E. Indies. Then the tide of conquest approached Rangoon, entry port for the all-important Burma Road (see BURMA ROAD), down which Britain sent munitions to Chiang Kai-shek, and was imperilling India itself. Southward it now began to menace Australia. By early May Mandalay had fallen and a large part of Burma was in the enemy's hands. (For operations in Burma, see BURMA. SECOND WORLD WAR, CAMPAIGNS IN.) The general strategic plan developed quickly from the opening day of the Jap. attacks, their first aim being to break the ring of 'encirclement' constituted by the Aleutian Is., Pearl Harbour, Guam, Manila, Hong Kong, Malaya, and Singapore, by simultaneous attacks on all of them, and then, by breaking Amer. and Brit. resistance in these centres, to render it impossible for the Allies to get near enough to Japan to bomb Jap. cities. In the gloom of these early months from Dec. to 9 April the one bright outstanding feature was the heroic and protracted Amer. defence of the Bataan Peninsula by the forces under MacArthur (q.v.). When at length the resistance ended MacArthur had already been in Australia for 3 weeks, where he took supreme command of Australian, Brit., Dutch, and Amer. troops.

In the course of the Jap. conquest of the numerous is. of the S. Pacific the hardest fighting took place in the Philippines. Organised resistance by the U.S.-Filipino armed forces on the Bataan Peninsula came to an end by 9 April. Much credit must be given to the defence for the maintenance of their positions for

over 4 months against vastly superior forces. Approximately 200,000 Jap. troops were employed against a defending army of some 36,000. The U.S.-Filipino defence had succeeded in containing a huge Jap. army which might have been effectively employed in other theatres of war; a proportion of the Jap. fleet and a large number of valuable transports had been immobilised for 4 months; the struggle had cost a great many Jap. lives and made a severe drain on Jap. resources of material; and, finally, the U.S.A. had been given time to recover from the shocks of the lightning attacks on her bases in Hawaii and elsewhere and to take steps to organise her forces for a continuation of the struggle.

In the E. Indies the Japanese landed in Brit. Borneo on 16 Dec. and occupied Tarakan a week later. Then followed landings in Celebes and Amboyna, and heavy air raids on Surabaya, Palembang, Kupang, and Banka. The Dutch authorities, however, destroyed many of the oil wells at Palembang before leaving the place. Bali was invaded in mid Feb., and both that is. and Banka were seized soon afterwards. The Japanese then advanced on Java, captured Batavia, pierced the Dutch defences at Bandung, and completed the conquest of the Dutch E. Indies by mid March. Hong Kong succeeded in holding out for only a little over a fortnight (see HONG KONG). The earliest Jap. landings in Brit. Malaya took place on 8 Dec. in Kedah, when there were raids on Penang and Singapore. This campaign ended by 15 Feb., the whole of Brit. Malaya being conquered in the space of 10 weeks (see MALAYA. BRITISH, JAPANESE INVASION OF, 1941-2). Sarawak was not in a position to resist for long, and the Brit. garrison was withdrawn to watch Borneo, which itself soon fell. The threat to Australia came first with the bombing of Rabaul in the mandated ter. of New Guinea (10 Jan.), followed by invasion shortly afterwards. Rabaul was seized on 22 Jan. Then came numerous Jap. air raids on Port Moresby, an important Australian base in New Guinea.

*Southern Pacific Campaign, 1942-3.* During the first 6 months of the war against Japan allied naval losses had also been severe, and included 2 aircraft carriers, 11 cruisers, 22 destroyers, and 5 submarines. Early in April strong Jap. forces had even raided into the Bay of Bengal, where they sank the Brit. aircraft carrier *Hermes* and 2 heavy cruisers. On 1 June Jap. midget submarines actually penetrated Sydney harbour. But 5 days later Jap. forces received their first real check at the battle of Midway Is., when 4 of their latest carriers were destroyed, in addition to a heavy cruiser, and they also lost about 250 aircraft and 3500 men. After this the Japanese reorganised their forces and, later in the mid year, again assumed the offensive in the S. Pacific. Their jungle troops broke over the serrated crest of the Owen Stanley Mts in New Guinea and began to push towards Port Moresby. They also sent forces to occupy some of the Gilbert Is. and began to build

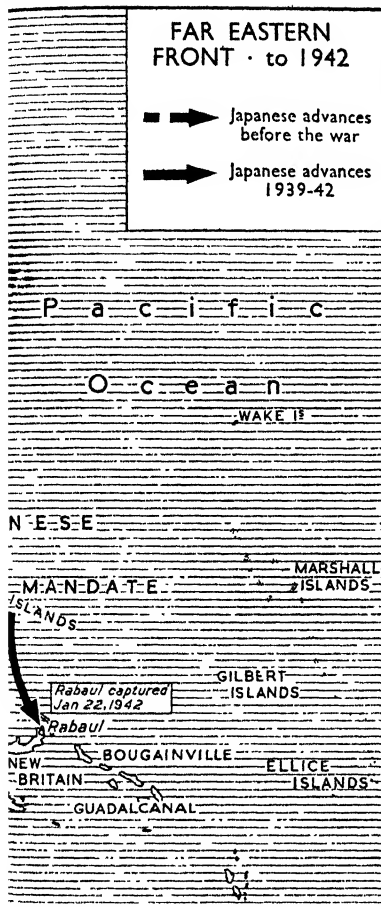


an airfield on Guadalcanal (q.v.) in the S. Solomon Is. But suddenly, on 7 Aug., the whole aspect of the Pacific warfare underwent a change, when Amer. task forces seized Tulagi Is. in the Brit. Solomons, and a beach-head, which included the almost-completed enemy airfield on Guadalcanal. However, on the night of 8-9 Aug. a Jap. cruiser div. and destroyers surprised the Amer. ships and sank 3 Amer. heavy cruisers and 1 Australian cruiser without much loss to themselves. Thus the supply problem for the Amer. marines who had been landed in the S. Solomons became serious, especially as the Japanese, landing men at night on Guadalcanal, now began a campaign of attrition. Yet so stubborn was

the fighting on either side that not until 9 Feb. 1943 did organised resistance end in the is. of Guadalcanal, Tulagi, Gavatu, Tanambogo, Makambo, and on parts of Florida. At the end of Aug. the Japanese entered Milne Bay, New Guinea, with some light reinforcements, but mainly with the aim of evacuating their invading troops. Australian combat troops, supported by Amer. and Australian air units, threw them back with heavy losses into the narrow confines of the peninsula N. of the bay, where large numbers were destroyed and all their heavy equipment was lost.

The collapse of the Jap. attempt to take Milne Bay was the first serious reverse which their land forces had suffered





in the New Guinea area. It was realised by the allied command that the effect of the recapture of the above-mentioned Solomon Is. would be largely counteracted if their forces were driven out of New Guinea. By retaking the Solomons they checked a threat to the sea communications between the U.S.A. and Australia, besides securing a possible base for future operations. The continued possession of New Guinea, and particularly of Port Moresby on its S. side, was essential to the defence of N. Australia. The Jap. troops landed at Buna, advanced and occupied Kokoda on the N. slopes of the Owen Stanley range, and, in the early days of Sept., were steadily climbing towards the pass 7500 ft above

sea-level in the mt range which constituted the real defence line of Port Moresby. The Japanese were within 30 m. of Port

covered with dense jungle, the Australians gallantly saved the greatest threat of all to their homeland. The chief contributory factors in this were the effective bombing of Jap. supply lines and the Jap. defeats in the Solomons, and also the out-flanking part played by Amer. ground forces flown in haste to New Guinea. The Japanese were driven back to the N. down-slope of the Owen Stanley range and were now fighting desperately to retain their foothold near Buna on the N. coast.

The position in the Solomons, however, had slightly deteriorated in Sept. and Oct., when the enemy began a heavy attack by land, sea, and air. But in the large-scale naval fight between surface vessels off Savo Is. between Guadalcanal and Florida the Japanese were successfully repelled in this, their strongest bid to recapture the S. Solomon Is. (see NAVAL OPERATIONS IN SECOND WORLD WAR). Except for losses of warships on either side, the situation, broadly, had remained unchanged since the previous Aug., after the Americans had seized Tulagi and the new airfield on Guadalcanal. But the Japanese held Bougainville, the northernmost of the group, in some force with airfields and anchorages, and they had anchorages in most of the intermediate is., such as Shortland and the New Georgia group. But Guadalcanal and Florida, with the harbour of Tulagi, remained firmly in the grip of the Allies, and the seizure of these 2 key positions had disrupted the whole Jap. plan of campaign. In Oct. the Americans hit a Jap. battleship and 3 cruisers and sank some destroyers. But a much heavier naval action was fought in the Solomons area between 12 and 15 Nov. when the Japanese suffered severe losses (see NAVAL OPERATIONS). This action marked the conclusive defeat of by far the strongest Jap. attempt to recapture Guadalcanal. The Allies were now free to threaten the enemy position in New Guinea, and their advance on Buna on the N. coast now developed under MacArthur. Allied troops occupied Buna on 2 Jan. 1943 after bitter fighting. However, the Jap. garrison at Sanananda near Buna was not yet overcome, and the enemy was also entrenched at various other points near the coast from Amboga to Madang. Further, though the work of the allied air force was improving, it had not prevented the Japanese from sending reinforcements into Lae, Salamaua, Finschhafen, and Madang.

During the first 6 weeks of 1943 Jap. resistance in Papua, on Guadalcanal, and in the Solomons was brought to an end, but from that time until July the Allies stood on the defensive in this area of the Pacific, checking severe Jap. counter-offensives. At the same time the ascendancy won by their air forces prevented any further aggressive enemy movement

by sea. But Japan, although at the fullest reach of her arm, hung on grimly, and the situation could be altered with any reasonable speed only by another allied offensive. This offensive began at the end of June under MacArthur. The Allies seized Rendova, an is. 5 m. S. of New Georgia. On New Georgia itself a landing was made without opposition. Viru harbour was taken, but stiff resistance began when the Allies approached the Jap. chief base in the central Solomons at Munda, on New Georgia. In New Guinea a fresh landing was made in Nassau Bay, where Australian and Amer. forces joined hands close to Salamaua. The port of Rabaul, which had been the Jap. advanced base in the Pacific since Jan. 1942, was the palpable objective of the Allies, but the struggle for it was likely to be hard. Long-range guns put ashore at Rendova islet were now shelling Munda airfield, only 5 m. distant. But though Munda at length fell on 6 Aug., the whole converging movement on Rabaul, begun late in June, made but slow progress. The attack in New Guinea had come to a standstill and, after the fall of Munda, the Japanese dug themselves in on Bairoka, with reinforcements. The Allies were in fact struggling in a vile country, thick jungles, dense thickets, and gullies, against carefully entrenched enemy positions. The scale of the original operation had to be modified. The factor compensating for the slowness and costliness of the land fighting, however, was the increasing scale of Jap. losses in the air and on sea. This was significant not merely in relation to the fighting in the Solomons area, but to the whole 'co-prosperity' (see NEW ORDER) sphere which Japan had to patrol and supply.

A strong force of U.S. and Canadian troops, supported by naval vessels, occupied Kiska in the Aleutians after landings which began on 15 Aug. The Japanese had already abandoned it. MacArthur, in a combined operation in New Guinea, brought off a notable success in effecting a strong landing near Lae, the result of which was to draw a ring round the powerful Jap. bases there and at Salamaua. The Japanese were taken by surprise when an Australian force was put ashore (4 Sept.) to the N.E. of Lae, thereby cutting it off from Finschhafen at the mouth of the bay. The next day Amer. paratroops were dropped in the Markham valley behind Lae, where they were joined by Australians who had covered over 50 m. through jungle and swamp from the Salamaua area to meet them, a remarkable feat of endurance involving a forced march of 5 days. The expeditionary force was protected by a strong screen of Amer. warships and aircraft. Heavy raids on the night of 3 Sept. had temporarily neutralised the Jap. bases on Wewak, Madang, and Rabaul. Jap. aeroplanes rarely appeared, and their navy did not try to intervene. The landing troops poured ashore without hearing a single shot and Lae fell to allied forces on 16 Sept. Lae was an important victory because it was from this base, with its

good anchorage, its airfields, and its coastal connections running to E. and W., that the Japanese directed the defence by land and air of their chain of strongholds, which at one time stretched as far as Buna and Gona. Salamaua fell to MacArthur a few days after the landing near Lae. It had been held by the Japanese since 7 March 1942. Soon after, the Japanese were turned out of Finschhafen by Gen. Blamey, the Australian commander, after he had made a daring landing in the enemy's rear and after some 11 days of fighting. But the pivotal place remained, as always, Rabaul in New Britain. With the hope of at least temporarily neutralising it, a very heavy air attack was launched by the Allies on 12 Oct. Three destroyers, 2 medium-sized merchant ships, 43 small sea-going vessels, and 70 harbour craft were sunk. The Japanese made what seemed to be a strong counter-offensive against Finschhafen, but though supported by air strength, they were thrown back into the Sattelberg. Bougainville Is. was at this time the only Jap. stronghold barring the Allies' way from the central Solomons to Rabaul. There was a second raid on Jap. shipping there on 4 Nov. (see NAVAL OPERATIONS IN SECOND WORLD WAR).

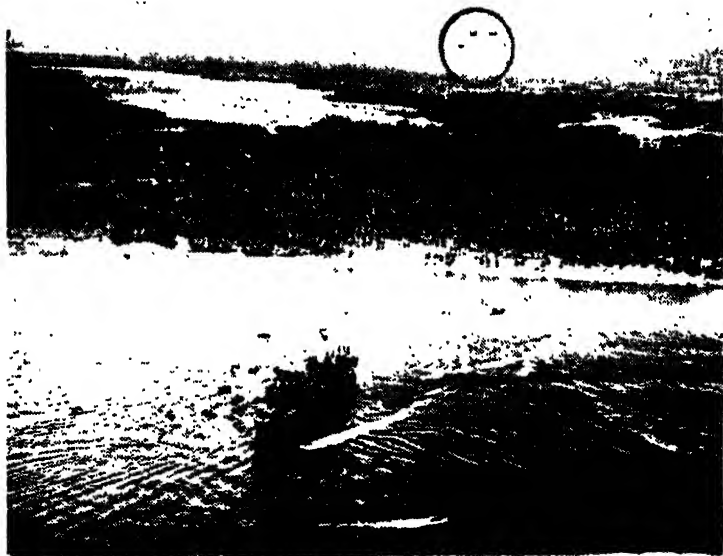
A substantial improvement of the Allies' position in the S. Pacific was effected by the capture on 20 Nov. of the Gilbert Is. (a Brit. colonial dependency) after a short and remarkably successful Amer. combined operation. The recapture of the airfields and harbours of the is. was calculated appreciably to extend the effective range of allied action in the Pacific and, correspondingly, to increase greatly the strain on Japan's naval position, besides bringing nearer the fulfilment of the hope of menacing the big Jap. base at Truk and of the positions in their mandated areas, the Caroline and Marshall Is. Yet perhaps the more immediately important consequence of the capture of the Gilbert Is. was the evidence it afforded of the Allies' growing naval strength in the Pacific.

The battle of New Britain began in mid Dec., when contingents of the Sixth Amer. Army landed on the S. coast of the is. between Gasmata and Cape Gloucester. No Jap. warships and only a fraction of the strong Jap. Air Force in the is. opposed the landing. The increasing activity of the Amer. bomber squadrons over the aerodromes and harbours of New Britain was probably the chief cause of this Jap. loss of the initiative by sea and air which was noticeable at Lae, again in the capture of the Gilbert and Marshall Is., and now again in New Britain. The end of the year, however, found the Japanese still firmly installed in the Ramu valley and on Huon Peninsula in New Guinea, and still holding Madang there, while in New Britain the Americans near Cape Gloucester were meeting with stiff resistance.

It is evident that throughout the period from the early Jap. conquests in the Pacific down to the sinking of the Bismarck Sea convoy on 3-4 March 1943,

and even later in the year, the initiative rested mostly with Japan. The Allies, however, took the initiative in occupying the S. Solomons (Aug. 1942), and again in the limited counter-offensive which Wavell's forces began in W. Burma in mid Dec. 1942. The allied victories in the battles of the Coral Sea (4-8 May 1942), Midway (4 June), the Solomons Sea (12-15 Nov.), the Bismarck Sea (2-4 March 1943), the Papuan campaign (Aug.-Nov. 1942), the action in Milne Bay (31 Aug.), and at Wau (30 Jan. 1943)

had attacked when Russia was pre-occupied elsewhere and when America was still unprepared, even psychologically, for war at all. Other factors which contributed to Japan's success were the utter inadequacy of the defenses of the E. possessions of the W. powers and the fact that they underestimated the quality of the Jap. armed forces and Jap. powers of strategy, and also the disparity in lines of communications. Thus all those areas which Japan had coveted as essential units of her 'co-prosperity'



*Imperial War Museum: Crown Copyright*

**LANDING OF U.S. REINFORCEMENTS AT GUADALCANAL, SOLOMON ISLANDS**

In the circle are three Japanese planes. Henderson airfield, much bombed and heavily shelled, is in the upper left section of the picture.

were all essentially defensive victories in which the Allies thwarted the designs of the enemy and resisted further aggressive moves on his part. Jap. success in the first 6 months of the war was of so sweeping a character that the Allies could not hope to recover until preparations on the largest scale were completed, and indeed it seemed that the initiative must remain with the Japanese until Germany was defeated, so as to relieve a great weight of sea and air power for concentration in the Pacific. Japan had, in the early months, occupied the richest colonial area in the world, and thereby secured unrestricted access to the raw materials, the lack of which had been the great weakness in her economy. Her success was only in part due to the fact that she

sphere were conquered with but slight loss and in less than 6 months. Yet, curiously enough, the Japanese then seemed to falter. The enemy had occupied Burma and yet did not proceed to the invasion of India, and the probable explanation of this hesitancy was that the speedy progress of her forces had strained her lines of communication. At all events, the Japanese then directed their efforts southward, in the direction of the Solomons and New Guinea, apparently for seizure as stepping-stones to the occupation of Australia and New Zealand. But they sustained an unqualified defeat in Milne Bay and again in the major naval engagement off Guadalcanal (12-15 Nov. 1942), while in Papua the Australians had checked their hazardous overland advance

on Port Moresby, the Owen Stanley range proving to be too formidable a natural obstacle for their troops. But they stabilised their positions at Gona, Sanananda, and Buna, and so compelled the Allies to begin long siege operations against all three. After being expelled from these points their forces, operating from Mubo, S. of Salamaua, tried to take Wau, the main allied base in the goldfields area in NE. New Guinea, their chief objective being the strategic airfield there, but they were foiled. In all this difficult period of the Allies' ordeal the severest strain was that imposed by the Papuan campaign, which involved dour and bitter fighting in which no quarter was given and none expected, and in which the Australians fought with such distinction. The Papuan campaign estab. the interdependence of land, sea, and air. Swift, efficient co-ordination in the use of all arms marked the early Jap. successes and demonstrated to the Allies that only a tremendous development of air and sea power, either alone or in co-operation with land forces operating either from Burma so as to reach the China coast, or from Australia, or from both, could be expected to achieve the task of expelling the enemy from his numerous consolidated positions in the S. Pacific, in Burma, and in SE. Asia.

Whether or not Japan could be defeated by taking the war into China was very doubtful. The one obvious way to defeat her was to gain command of the Jap. seas. That alone would make it possible for the Allies to blockade the country and to construct airfields on small is. within a range from which to maintain constant air attack on Japan's home base and so, gradually, to cut off reinforcements and supplies from the Jap. armies on the Chinese mainland and elsewhere. Thus the vital war against Japan was the war at sea, and the advances being made into Jap.-controlled seas and the whittling-down of Japan's sea power by the destruction of both warships and merchant ships were bringing nearer the day when the Jap. fleet must emerge and try to repel the allied fleets. The longer Japan postponed this decisive action, the greater grew the odds against it.

By the beginning of 1944 the initiative on and above the seas and among the multitudinous is. was entirely in the hands of the Allies. On the ground, too, the balance was against the Japanese, the Americans and Australians being now their equals in the arts of jungle warfare. Of the Jap. garrisons previously located among the Solomons only a few troops remained, marooned on Choiseul, and the garrison of Bougainville. In New Britain itself, apart from the strong Rabaul garrison, the Jap. troops were in occupation of a number of ports, which could communicate with each other only by sea, the is. being as dense with jungle and as trackless as New Guinea. From the Jap. failure to intervene in the defence of the Gilbert Is. or to attack the escorts of the expeditionary forces disembarked on New Britain or on the N. coast of New

Guinea, it was evident that their offensive strength at sea had been so impaired by their losses of aircraft-carriers, cruisers, and destroyers that they had resigned the initiative and were condemned to a naval defensive of diminishing strength. Also, since the development of the allied counter-offensive, the Jap. mercantile marine had been subjected to almost daily air attack, and Amer. airmen and their Chinese allies had begun to strike hard at its vessels in S. Chinese and Indo-Chinese ports; Brit. and Amer. aircraft were making the Singapore-Rangoon route perilous; and all over the W. Pacific from the Jap. coasts to the E. Indies it was being subjected to relentless attrition by Amer. submarines. The allied successes did not, of course, presage a speedy termination of the Pacific campaign, nor mark the end of 'island-hopping,' since the seizure of Is. air-bases was a necessary condition of the allied advance either in this theatre or farther W.; but they revealed the ability of the Allies to hold and to exploit the initiative which their sea power had regained.

*Attacks on Marshall and Caroline Islands: Paramushir, Kuriles, Northern Pacific.* Powerful Amer. air forces, land-based and carrier-borne, were sent by Adm. Nimitz, at the end of Jan. 1944, to attack Jap. bases in the Marshalls. Amphibious forces then landed in the Roi and Kwajalein areas and estab. beach-heads near the enemy bases. Strong opposition was encountered, but Namur was soon captured, and of the Kwajalein garrison of 2000 some 1250 were slain for nominal Amer. losses (2 Feb.). On 4 Feb., by bright moonlight, an Amer. fleet under Rear-Adm. W. D. Baker poured hundreds of tons of shells into Paramushir, in the Kuriles, the prin. Jap. naval and air base in the N. Pacific. The naval bombardment was followed by a bombing attack, the Japanese being taken by surprise and evidently demoralised. These operations marked the first attack of the war on Jap. home ter., apart from an Amer. air raid on Tokyo early in the war. On 16 Feb. strong Amer. task forces of hundreds of aeroplanes by daylight attacked Truk, the great Jap. naval base in the heart of the Carolines. Towards the end of March the U.S. Pacific Fleet made heavy attacks on the Jap.-held Palau Is., some 550 m. E. of the Philippines. The attacking force included aircraft carriers and battleships, and the attacks were co-ordinated with other attacks made by bombers on the Carolines. In these attacks 25 Jap. ships, including 2 destroyers, were sunk, and 200 aircraft destroyed.

*New Guinea Landings.* Early in the New Guinea campaign small garrisons of Dutch E. Indian troops manned isolated outposts in Dutch New Guinea, supported by small detachments of Americans. Towards the end of March Australian troops were landed, strategic considerations demanding that these outposts, which guarded the approaches through Torres Strait to Port Moresby and Darwin, should be consolidated. This part of New Guinea has a central mt barrier even more



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AUSTRALIAN TROOPS IN NEW GUINEA

Members of an Australian infantry battalion in their positions at Green Snipers Pimple, Shaggy Ridge. The capture of this point gave the Australians a feature which dominated the Japanese line of communication and opened the way to Bogadjim.

formidable than the Owen Stanley range, while the coastal region is a large swamp covering tens of thousands of square miles. A month later allied forces landed at 3 different points in N.E. New Guinea, capturing the Humboldt Bay region and Hollandia. This move was a spectacular development in the long-range plan designed to free New Guinea from Jap. control. The operation involved the biggest assembly of air, sea, and land forces yet seen in the SW. Pacific, including a formidable aircraft-carrier force which kept watch for possible enemy interference which might come from the air. By the end of May the end was in sight for the Japanese in New Guinea. Strong isolated centres of resistance survived in the coastline between Alexishafen and Hollandia, but they were a diminishing quantity.

The sea-power of the Allies was unchallenged in a circle radiating from their powerful New Guinea bases. MacArthur's forces were steadily edging westwards. Hollandia, like other selected spots, was attacked from the air, and convoys with strong naval support took in troops and much equipment for the capture and reconstruction of strategic airfields. No considerable opposing force was met in these months. Remarkable work was done by the Americans on this newly recovered ground. It was well suited to spanning the gap of ocean and is, between allied ter. in the Pacific and Japan. It was an engineering expedition rather than a plan of battle. Moreover, by expending the maximum in explosives, ammunition, and supplies, the Americans conserved the lives of their soldiers. They realised that it did not pay to risk man-power to attain an objective that could be won as easily with arms or machinery. Thus highways were carved out of mts or thrown across sago swamps as occasion required; huge bulldozers forced their way through kapok plantations and diverted rivers. Amphibious craft plied from ship to shore in the rush to bring up supplies. Air-strips were laid down swiftly and, having served their brief purpose, were discarded. Possession of advanced fields enabled bombers and fighters to be over enemy ter. at all hours, and all the nearer enemy fields had now come under persistent Amer. and Australian bombing. At night patrolling torpedo-boats were destroying all surface craft they could find. Doomed and desolate at the other end of New Guinea stood Rabaul, a monument to the art of encirclement in war. It was now a target for allied bombers whenever they chose to attack it.

*Invasion and Capture of Saipan.* Guam retaken. The next important operation was that of the Amer. expeditionary force on Saipan Is., 15 June, most important of the Marianas, 1500 m. S. of Japan. This bold Amer. action was a direct challenge to the enemy in a vital area; for the loss of Saipan would threaten the inner ring of Japan's conquests and her communications through the China Sea. Japan decided to try a surprise attack on the U.S. Fifth Pacific Fleet, which, together with Brit. naval units, was engaged in protecting the forces invading Saipan. On the evening of 20 June, however, an attack on the Jap. fleet was made by Amer. aircraft and naval units, which bombed and sank 3 carriers, 1 battleship, a destroyer, and smaller vessels, there being no actual loss of ships on the Amer. side. In these engagements the Americans lost 110 aircraft as against 335 Japanese. Saipan was now virtually lost to the enemy. Originally it had a Jap. garrison of 20,000, in an area of 70 sq. m. Of that garrison 19,000 died fighting. Amer. casualties were correspondingly heavy, 15,000 in killed and missing. This was by far the biggest-scale fighting in the is., as also the most ferocious. It was found that there remained at least 45,000 Japanese in the Wewak-Aitape area of New Guinea, and there were signs that they,

too, cut off by allied sea-power, would, like the Saipan garrison, fight to the last. But the Saipan victory proved that the Allies held the initiative. The gradual, if slow, approach of allied arms to Japan proper was marked on the night of 9 July, when Amer. Superfortresses attacked the Jap. mainland for the second time within a month, bombing installations at the great naval base of Sasebo, on Kyushu Is., and industrial objectives at Yawata, 65 m. farther E. The loss of Saipan precipitated a political crisis in Japan, for Tojo ceased to be Prime Minister, a new ministry being formed under an admiral and a general. Added to the loss of Saipan was the knowledge of the military and naval chiefs that utter disaster threatened Japan in the S. seas, and in that 'co-prosperity' sphere which Japan had marked out as her own. Defeat in Burma, where the much-publicised invasion of India had proved a costly failure; the mounting losses of the Jap. mercantile marine (Brit. submarines at this time sank over a score of Jap. supply vessels, besides damaging others); the impotence of the navy to rescue, reinforce, or even revictual the starving and fever-stricken armies marooned in New Guinea and other Pacific is.—these were the fruits of Tojo's stewardship. His successors could have no very good hope of extricating Japan from the plight into which Tojo had led her by his policy of dispersing Jap. strength over a multitude of is. which failing sea-power could not defend. On 21 July an Amer. expeditionary force of marines and infantry invaded the much-battered and important is. of Guam, which had fallen to the Japanese on 12 Dec. 1941, and which is the southernmost and largest of the Marianas, 130 m. S. of Saipan. The invading force went ashore under cover of a heavy bombardment from carrier aircraft and warships of the Fifth Fleet and estab. beach-heads at all predetermined points. Guam's importance to Japan lay in the fact that it covered her supply line through Burma and the Dutch E. Indies. Amer. tanks were landed within 4 hours of the attack on 21 July. The struggle, however, promised to be a hard one, comparable to the fighting in Guadalcanal. But by 10 Aug. all organised resistance had ceased.

*American Invasion of the Philippines.* Thousands of Japanese still remained in Brit. New Guinea, New Britain, New Ireland, and the Solomons; but all were watched by allied garrisons at well-chosen vantage-points and subjected to almost daily bombing, besides being worn down by starvation and disease. Hence these large bodies of enemy troops were no longer a menace, though sooner or later they would have to be dealt with. Thus the Allies were free to develop their campaign against the Philippines. On 15 Sept. Amer. marines and army assault force of Adm. Nimitz's command landed in the Palau Is., Japan's nearest and strongest bastion E. of the Philippines, 550 m. away. Simultaneously Gen. MacArthur's force successfully occupied

the Morotal Is., 300 m. SE. of the Philippines. The way for both landings had been prepared by massive attacks on the central Philippines by carrier aircraft of the Pacific Fleet a few days earlier. A week later, on 2 consecutive days, carrier-based aircraft raided Manila for the first time, a convincing proof of the Allies' rapidly growing superiority in carriers. By this date (25 Sept.) the U.S. Third Fleet in the far W. Pacific had sunk 122 ships (excluding 61 small craft), damaged 137 ships and 109 small craft, and destroyed 980 aircraft. These operations of the Third Fleet had forced the Japanese to withdraw their naval forces from their former anchorages in the Philippines and seek new refuges in the same general area. Japan's sea lanes were now confined to the China Seas, the rest of the wide Pacific being dominated by the U.S. fleet, while the Jap. Navy stood off, unwilling to risk an encounter. The war-makers of Japan evidently believed before 1941 that if they could get all the known is. airfields and build a few others in the outer perimeter they would be unassailable. They omitted from their calculation the tremendous industrial potential which permitted the Americans to go into any is. or atoll, tear down tracts of jungle, and build there new first-class air-strips in days or weeks. Heavy blows now rained down on Jap. shipping resources. The expected Amer. invasion of the Philippines began on 20 Oct., when, in a great amphibious operation, MacArthur's forces seized the E. coast of Leyte Is., 600 m. N. of Morotal and 2500 m. from Milne Bay, whence the offensive, in effect, had begun 16 months previously. By seizing Leyte, which lies between Luzon and Mindanao, the Americans split the Jap. forces (estimated to number 225,000, under F.-M. Count Terauchi) in the Philippines in two. The landing was preceded by a devastating naval and air bombardment. Within 10 days the Americans had disorganised the Jap. defence of Leyte, the enemy's losses in killed and wounded being 14,400, or half their force, and also captured virtually all Samar, the is. next to Luzon. Tacloban, the cap. of Leyte, and its airfield were captured soon after the landing, as also was the airfield at Dulag, thus giving the Americans airfields from which eventually the rest of the Philippines might be won back. Great as was the real strategic significance of the invasion of Leyte, the political and moral aspects of MacArthur's return to the Philippines in Filipino eyes tended to overshadow the military aspect, for in 1942 nothing had so deeply underlined the truth of Japan's initial advantage as her capture of the Philippines, despite the utmost efforts of a supremely tenacious defence. Simultaneously with the advance into Leyte, the Jap. Navy sustained a very heavy defeat in the Philippine Sea, some 58 Jap. warships being sunk or damaged (for details see NAVAL OPERATIONS). The conquest of Leyte was practically completed before the end of the year, the Jap. losses being over 80,000, compared with some 10,400 Amer. casualties.

On 9 Jan. 1945 MacArthur led the invasion of Luzon. The invasion was one of the biggest amphibious operations of the war, over 100,000 men being landed, with their supplies and great quantities of tanks and guns, from an armada of 1000 ships, including 800 transports. President Osmena, of the Philippine Commonwealth, issued a proclamation on 10 Jan. exhorting all Filipinos to rally to MacArthur's forces. Bombing of key-points and bridges on the railway from Manila to Lingayen, of airfields close to Manila, and of bases at Baguio and Rosario, to the NE. of Lingayen Gulf, seriously obstructed the movement of Jap. reinforcements towards MacArthur's chosen battle-ground on the great central plain.

*Manila captured by the Americans.* The Jap. rout in Luzon was a foregone conclusion, for their local air-power and airfields had been destroyed long before MacArthur's landings, and their garrison had been much depleted in a vain effort to stave off defeat in Leyte. Moreover, MacArthur's intelligence service throughout the Jap. occupation had been remarkably reliable, being supported by Filipino co-operation. Four Amer. divs. were employed at the beginning of the campaign. One held the right and two the left flanks, while the main advance was made by the 37th Infantry Div. towards Manila. Subsequently the 1st Cavalry Div. was added, and these 2 divs. reached the outskirts of Manila on 3 Feb. Meanwhile diversionary landings had been made in Subic Bay and on the Batangas Peninsula, while an airborne div. moved northward from Batangas to close the pincers. The whole plan was well conceived, but the Japanese so neglected their opportunities that it was never put to any severe test. A Jap. force still held out within the walls of the old Sp. city of Manila with desperate ferocity, but it was already unlikely (16 Feb.) that the rest of the Jap. garrison could be of more than a nuisance value in the country around Baguio or farther N. In W. Luzon Bataan was captured (16 Feb.) by the Americans after landings on the S. coast.

*Sumatra Raided.* On 24-29 Jan. 1945 2 strong attacks were made by aircraft of the B. Fleet on Jap. oil refineries on Sumatra. A powerful force, commanded by Sir Philip Vian, struck a crushing blow at the enemy's oil supplies. These attacks were made by carrier-borne aircraft on refineries at Palembang in S. Sumatra. At the same time as this heavy blows were struck at Iwojima in the Volcano Is. by battleships and cruisers, which bombarded the is. on 24 Jan.

*Tokyo bombed. Invasion of Iwojima.* The first of a series of air attacks on Japan was begun on 16-17 Feb. 1945, when 1500 Amer. aircraft attacked Tokyo and Yokohama. These aircraft were launched from an immensely powerful Amer. naval force, which included a score of the fastest and largest carriers, escorted by battleships. The air attack on Tokyo gave the Japanese a terrible lesson in Amer. power. The command of the sea secured by the battles off the Visayas in

Oct. 1944 had given the Amer. high command the opportunity of carrying the war to the heart of Japan whenever it chose. While Adm. Mitscher's task force of carriers and escorts was thus engaged, another force was in action off the Bonins, which are less than 700 sea miles from Tokyo Bay. This force was bombarding and bombing the enemy's positions on the already much-bombed is. of Iwojima as a prelude to landing. Amer. marines landed on Iwojima on 19 Feb. Some 800 vessels, including battleships, took part in the attack. The invasion of Iwojima was one of the sternest tests in the hist. of America's wars, and Amer. casualties were heavy, for the enemy was seasoned and expert and took every advantage of the broken, boulder-strewn terrain, and was strongly supported by artillery, mortars, rockets, and machine-guns, besides extensive minefields.

*Battle for Intramuros ended.* In Manila there had been some weeks of most bitter fighting, but by 20 Feb. the Japanese had been compressed into an area of only 1200 yds by 800 yds in the walled city of Intramuros. Jap. casualties in the 6 weeks' campaign on Luzon were at this date (20 Feb.) 92,000 and the Amer. 13,000. The battle for Manila ended on 24 Feb. 3 weeks after the Americans had entered the city.

*The Americans in Corregidor.* MacArthur returned to Corregidor on 2 March, 3 years after the Japanese had overpowered the exhausted Amer. garrison and he himself had flown to Australia. Its reconquest began on 18 Feb., when the first Amer. assault troops landed after a massive bombardment had silenced the great guns of the forts. Some 3000 Amer. infantry and paratroops, who carried out the attack, were opposed by double the number of Japanese; but their casualties were relatively light, while the Japanese lost over 4200 dead. The battle for Luzon was now reaching its end. Amer. airborne troops, having captured Balayan, had reached the S. end of the is.

*Further Raids on Japan.* Further air attacks were made on Japan on 9 March, by which time some 15 sq. m. of Tokyo, the heart of the city's business and industrial dists., were only a blackened and smouldering ruin. At the same date other Superfortresses, which had flown from bases in the Marianas, attacked Nagoya in great strength. Osaka was pounded on 13 March.

*Invasion of Okinawa. Japanese Fleet defeated South of Kyushu. Tokyo's Arsenal Area burned out.* In a carrier-plane assault on the Inland Sea, 18-19 March, a task force of Adm. Spruance's fleet, under Vice-Adm. Mitscher, damaged a score of Jap. ships and destroyed about 500 planes. No Amer. ships were lost, and Amer. aircraft losses were extremely light.

An Amer. force of about 100,000 men, supported by a large fleet of warships, including a Brit. task force under Sir Bernard Rawlings, invaded Okinawa, largest of the Ryukyu Is. (67 m. long), some 325 m. SW. of Kyushu, in the biggest

amphibious operation of the Pacific war. The landings began on the W. coast on 1 April, and very soon 2 airfields were captured. The Jap. garrison numbered some 100,000 men. It was to be expected that the Japanese would offer fanatical resistance, especially as the distance of the is. from the Jap. mainland was only half that between Japan and the is. of Iwojima (660 m.), which latter was now in Amer. hands. The Jap. fleet slipped out from its Inland Sea bases with the evident intention of attacking the Amer. invaders of Okinawa or the allied warships protecting the land forces there. But on 7 April 6 of the enemy warships, the 45,000-ton *Yamato*, 1 light cruiser, and 4 destroyers, were sent to the bottom, while another destroyer was set on fire, in a 2-hour engagement with aircraft of Mitscher's carrier force, 60 m. S. of Kyushu. Of all the enemy ships engaged only 3 destroyers escaped. Only 1 ship of the U.S. force suffered minor damage and 17 naval aircraft were lost. In all engagements during the 2 days the Japanese lost 417 aircraft. It was calculated by Amer. naval officers that in this engagement Japan lost about a quarter of what remained of her navy.

Meanwhile Amer. marines were pushing northwards in Okinawa against negligible resistance, but Amer. troops moving southwards were making only slow progress. On 20 April, in one of the fiercest battles of the Pacific war, 3 Amer. infantry divs., after a deadlock of a fortnight, launched an attack against these intricate defences following one of the heaviest bombardments ever made in the support of amphibious troops. Meanwhile Amer. Superfortresses continued their series of attacks on Tokyo and other tns in Japan.

*The Battles for Okinawa.* There was to be no easy conquest of Okinawa. As a vital outer defence to the Jap. mainland the Jap. troops in Okinawa meant to fight to the death. The number of their dead had risen to nearly 39,000 by 10 May, at which date the N. half of the is. was under Amer. control. A few days later Amer. infantry were fighting in Naha, chief tn of the is. The allied objective was to secure airfields on Okinawa for intensified air raids on the Jap. mainland, and the Japanese had to prevent this at all costs. Many 'suicide' attacks at terrific cost were made by Jap. planes against Amer. warships and ground forces at Okinawa. By the beginning of the eighth week of the great battle for the S. part of the is. the Amer. troops had not yet broken the main line of the Jap. defence. Though they had made their initial landings without opposition, they had been able to advance only 7 m. in as many weeks. Though by 20 May the total of Jap. dead had risen to more than 48,000 out of a force estimated to have been in the beginning 85,000, their fighting was still as resolute, skilled, and fierce as ever, though they were constantly under fire from naval guns, ground artillery, and small guns, and from aircraft many times greater than the fire they could return. The Amer. losses by this date were 8300 dead and 22,200 wounded.

*Tarakan invaded.* Australian and Dutch troops, who landed on Tarakan Is., off the N.E. coast of Borneo, on 1 May, soon gained control of nearly all the practicable area, including the cap., the roads, and the oilfields, leaving the Japanese with only the central lilly part. Here again, as on Okinawa, Jap. resistance was most tenacious and the natural obstacles were great.

*Japanese Cities bombed.* Meanwhile massive air raids were being constantly carried out against the Jap. mainland cities. Some 9 sq. m. of densely populated Nagoya, one of the largest centres of Jap. aircraft and machine-tool production, were laid waste on 13 May, when 500 Superfortresses from the Marianas bombed the N. and N.E. areas of the city with 3500 tons of incendiary and explosive bombs. This was the fourth time Nagoya had been heavily attacked by Superfortresses. Two days later Nagoya was again attacked with incendiaries, and on 26 May a strong force of Superfortresses dropped 4000 tons of incendiary bombs on Tokyo. Yokohama was attacked for the first time by Superfortresses on 28 May. At the same time further blows were struck at Tokyo and at Kawasaki, between the cap. and Yokohama. On 5 June nearly 500 Superfortresses made an incendiary attack on Kobe, the targets being railway stations, steel works, and shipyards. A similar force of bombers made a daylight raid with incendiaries on 31 May on Osaka, the targets being harbour facilities, shipyards, aircraft-propeller works, and electric power stations. Six days later the city's arsenal was attacked by bombers with high explosives as well as incendiaries.

*Wewak and Bougainville Battles.* Meanwhile it remained to reduce the Jap. troops still holding out in parts of New Guinea and the Solomons. In an amphibious operation Australian troops captured Wewak Peninsula and Wewak airfield in N. New Guinea in an assault aimed at the capture of the major Jap. base of Wewak (11-13 May). By 15 May the Australians were in control of Wewak harbour. Elsewhere in the S. Pacific there was heavy fighting in Bougainville Is. In 6 months of fighting on this is. the Australians had killed 5000 Japanese and advanced 60 m. S. to the Pororei R. and 75 m. N. to Bonia Peninsula and estab. themselves across the Hongorai R.

*Okinawa almost conquered.* The conduct of the Okinawa campaign did not satisfy all Amer. critics, some of whom pronounced the campaign to be a set-back. Truman announced that army casualties on Okinawa between 18 March and 29 May were 10,221 killed and missing and 27,704 wounded. Jap. deaths were sixfold those of the U.S.A. On 2 June a fresh landing was made by Amer. troops on the Chinen Peninsula. Most of the peninsula was occupied on the 4th, together with almost all the Naha airfield. Only 16 sq. m. of the is. remained in Jap. hands on 11 June, but the campaign was still difficult. By 20 June the Jap. defence of Okinawa was in its last stage, for of the original



garrison estimated at 100,000 only some 2000 were now still alive, and these were trapped. With the reduction of the Is., the Americans had secured an air base of incalculable value, being only 330 m. from the nearest Jap. home is. From this base and from bases in Iwojima and the Marianas the Americans were now able to bomb Japan daily with such a weight of explosives as had never been dropped anywhere before. Moreover, from Okinawa they could now maintain such a command of the approaches to Japan from the S., from the Chinese mainland, and from Korea, that the Jap. dwindling stream of supplies from the outside world would soon be almost stopped; for on its E. coast Okinawa had a deep-water anchorage big enough for a great fleet, and sheltered from typhoons.

*Japanese Garrisons in the Philippines, Solomons, and New Guinea marooned. Truk bombarded by British Fleet.* While the weight of the allied attack on the heart of Japan was now increasing rapidly, its front was being steadily broadened. In the Philippines the enemy's situation was desperate, for MacArthur's forces were crushing the remnants of the largest army which the Japanese had sent overseas since they attacked Britain and America. What the Jap. war leaders feared above all was the explosion of the legend of a divinely assured inviolability of the Jap. homeland, and so far allied bombers had destroyed nearly 1,250,000 buildings and rendered 5,000,000 persons homeless in half a dozen of the chief cities from March to May, and still the attacks were mounting in power. In the SW. Pacific the Australians were steadily wearing down the resistance of the marooned garrisons in New Guinea, New Britain, and Bougainville. In the central Pacific large garrisons, by-passed by the Americans, sat aimlessly in Truk and other atolls awaiting the supplies that never came. Truk atoll, the 'Gibraltar' of Japan, was attacked by the Brit. Pacific Fleet on 14-15 June. Aircraft carriers, cruisers, and destroyers left the place a battered wreck; but it was still estimated to hold a garrison of 40,000, and therefore still constituted a threat to allied forces and bases in the SW. Pacific area. Meanwhile the Allies opened new fronts in Borneo and in China. While Australian and Dutch troops were overcoming Tarakan, other Australian forces landed on Labuan and at points near Brunei in the N. of Borneo. In China the Japanese at length seemed to be losing ground, for a Chinese advance won back Foochow, while another Chinese attack from Kweichow was threatening the Jap. land communications from Indo-China.

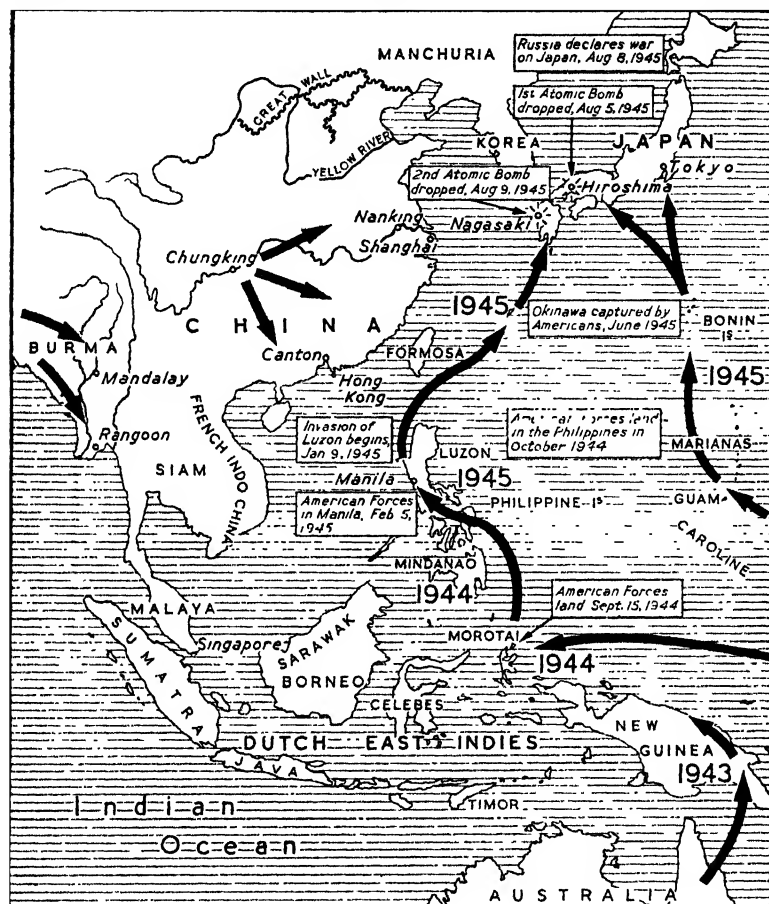
*Japanese Key Defences on Borneo isolated. The Battle for Balikpapan.* Australian troops, under cover of a combined Amer. and Australian naval escort, made a further landing in N. Borneo on 19 June at the refinery centre of Lutong in the Brit.-protected state of Sarawak, the Japanese making no attempt to hinder the landing. Other Australians landed on 1 July at Balikpapan, in SE. Borneo,

after a heavy naval and air bombardment by U.S. forces. MacArthur went ashore with the first wave of assault troops. The Jap. key defences on Borneo had now been isolated by this new landing, following on the seizure of the bases of Tarakan Is. and the Brunei Bay area and Miri oilfield. Furthermore, the strategic Macassar Straits, gateway to the Java Seas, were now controlled by allied surface craft, as well as by aircraft and submarine. The whole extent of Java and the important ports of Surabaya and Batavia were now within easy flight range. Allied ships could now, with land-based cover, go to any point in the SW. Pacific. But there was very heavy fighting for Balikpapan. The main part of the Is. fell to the Australians on 3 July. A scene of desolation confronted the Australians as they doubled from the encircling ridges into the centre of the Is., which the Japanese finally surrendered almost without a fight.

*Anglo-American Naval Air Attacks on Tokyo Area.* More than 1000 naval aircraft of the Amer. Third Fleet struck at Tokyo on the night of 9 July. Four battleships, 4 cruisers, and 14 destroyers also took part. This was the thirty-fourth consecutive day of air attacks on the Jap. mainland. Two days later Adm. Nimitz announced confidently that the Americans had won 'complete mastery of the skies over Tokyo.' The main Is. of Honshu came under terrific attack on 9-10 July. Hundreds of carrier-borne bombers swept over the 100-m.-wide Kanto plain, aircraft centre of Tokyo's defences, while incendiaries and explosive bombs rained down on half a dozen industrial tns. On the 16th Brit. ships took part for the first time in air attacks in great strength against the Tokyo area.

Thus the storm of attack now beat more fiercely every week on the airfields, ports, and industrial cities of the Jap. homelands. Blows that at first were struck from the air alone were now also being delivered by the Amer. and Brit. fleets. So far the Jap. battle fleet, sorely crippled by its heavy defeat off the central Philippines the previous Oct. and by the great air attacks it had subsequently endured, had remained passive and had done nothing to protect coasts which the Jap. people had until this period believed inviolable. Even the suicide aircraft which had often inflicted loss and damage on the allied fleets in May-June were now conspicuously absent in these latest operations.

In Jap. home waters, most important of the sev. theatres in which the Far E. war was being fought out, the concentration of allied strength had now reached massive dimensions. Great fleets had gathered together. The ring of allied air bases was contracting and closing in on Japan. Attack which in the previous spring could be launched only by bombers of the longest range from the Marianas and Guam could now be delivered from Okinawa. Steaming boldly inshore on 15 July, where the rugged Muroran hills are plainly visible, the Amer. battleship *Iowa* and other ships of the bombardment group




pounded the great Nihon steelworks and Wanishi iron-mills on Hokkaido. Not a single Jap. plane appeared, nor did the shore batteries reply. Extensive damage was inflicted by Brit. and Amer. carrier- aircraft on 16 July on Jap. warships, merchantmen, and airfields in the Tokyo area. On 20 July, a force of 600 Superfortresses dropped 4000 tons of incendiary and other bombs on the industrial cities of Choshi, Hitachi, Fukui, and Okazaki.

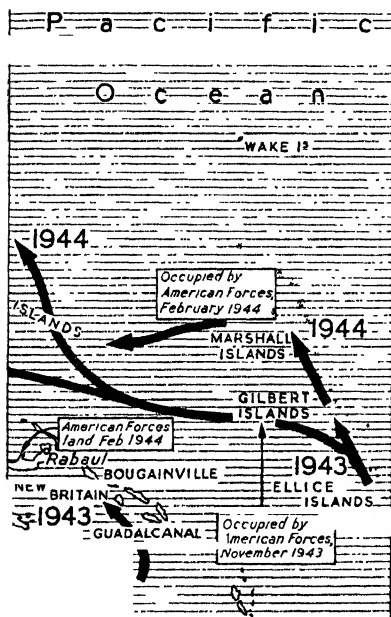
**Australian Victories in Borneo.** Meanwhile the Australians in Borneo crossed Balikpapan Bay, landing on its W. coast and pressing inland against negligible resistance. But in the N. and NE. there was bitter resistance. However, the Australians took the Manggar airfield on

10 July and on the 10th captured Mt Batochampar, the fall of which marked an important stage in the campaign. Samboja, two-thirds of the way to the main oil production area, was taken on 20 July.

**Anglo-American Air Attack on Japanese Fleet.** Further Superfortress Raids on Japanese Cities. Adm. Halsey's Anglo-Amer. carrier aircraft, towards the end of July, attacked the Jap. fleet in its bases at Kure and Kobe. One battleship, 2 carriers, 3 cruisers, 1 destroyer, and 3 submarines were sunk, and 4 destroyers, 2 destroyer escorts, and 6 freighters damaged. Some 94 Jap. planes were wrecked and 56 others damaged. Opposition was negligible.

# FAR EASTERN FRONT · 1943-45


 Allied thrusts  
and progress across  
the Pacific battle area



Heavy air attacks on Jap. industrial centres continued. On 1 Aug. 800 Superfortresses, the largest force launched against Japan in the war, dropped a record load of 6000 tons of bombs on the industrial towns of Hachioji, Toyama, Nagasaki, Mito, and the petroleum estab. at Kawasaki.

**Mounting Toll of Japanese Naval Losses.** Jap. shipping continued to suffer ever-increasing losses. During July Amer. aircraft from Okinawa destroyed or damaged 250 Jap. vessels totalling 250,000 tons. The object of this intensified air war was to cut off Japan from her sources of raw materials, food, and fuel, but irreparable damage was also done to her internal communications, naval bases,

airfields, and factories. To accomplish these purposes Okinawa was being expanded into the greatest air base in the world. The Jap. navy had virtually disappeared as a fighting force. Japan seemed to repose some hopes on the suicide aeroplane as a secret weapon, but while this aeroplane had unquestionably done damage, it was negligible as an effort to diminish the terrible crescendo of air attack that was now crashing down upon the ports and cities of the homeland.

**The Atomic Bomb.** *Russia declares War on Japan.* On 6 Aug. a selected port, Hiroshima, was made the victim of the Anglo-Amer. new secret weapon, the first atomic bomb. Only 1 bomb was dropped on that day, but it had an explosive power equal to 20,000 tons of trinitrotoluene and had more than 2000 times the blast power of the largest bomb used up to that time. Small wonder that part of Hiroshima, a town or base of 244,000 inhab., was wiped out at one single blow (see further HIROSHIMA). Then on 8 Aug. Russia declared war on Japan, and on the next day the Red Army attacked along the Manchurian border.

**Japan surrenders.** A second atomic bomb was dropped on 9 Aug., this time on Nagasaki. The bomb used here was said to have rendered obsolete that used against Hiroshima. One-third of Nagasaki was wiped out. The use of the atomic bomb received even at the time a mixed reception from public opinion both in America and in Britain, and, subsequently, its use at this stage of the war, when Japan was already clearly defeated, has been questioned on moral grounds by numerous commentators and thinkers. It is only necessary to state here that the bombs were a means of hastening the collapse of Japan. For apart from having no defence to the new bomb, Japan's sole recent successes in the war were those won by suicide aircraft, which had sunk 24 warships and damaged 164 others with great loss of life. Months before the dropping of the first atomic bomb Japan had been brought to measurable distance of collapse as a result of the destruction of her fleet and the increasing air blows at the homeland, although Japan still had a very strong army (in the homeland 2,000,000 trained professional military personnel, in China, Manchuria, and Formosa 3,000,000 men), and a considerable air force (11,000 aircraft, of which 6000 were combatant types). Japan had, however, entered the war with 12 battleships and now had but 1, the *Nagato*, and even that was heavily damaged and without a crew. Of her 9 front-line carriers the *Hatake* and the *Katsuragi*, both heavily damaged, alone remained. Of 19 heavy cruisers, only 2 remained, both badly damaged. Similarly, of 24 light cruisers, but 2 were left. The number of destroyers, estimated originally at 165, was now reduced to 26, sev. of which were badly damaged. Of the original 140 first-line submarines only 16 remained, in addition to 6 former Ger. U-boats. Even so, the invasion of Japan might have been resisted to the end, and would no doubt

have entailed enormous casualties, a prospect which was unquestionably eliminated by the dropping of the atomic bomb. The same day the atomic bomb was dropped on Nagasaki the Jap. Gov. announced their readiness to accept the Allies' Potsdam terms of surrender, provided they did not prejudice the prerogatives of the emperor. The Allies' reply, while not asking for the emperor's abdication or dethronement, made it clear that his authority, together with that of the Jap. Gov., should be subject to the allied supreme commander from the moment of surrender and that the emperor himself would be required to authorize and ensure the signature by the Jap. Gov. and the imperial general H.Q. of the surrender terms, and, further, that the emperor must issue orders to commanders in the field to cease fire and surrender their arms, and be ready to issue any other orders which the allied supreme commander might demand in order to give effect to the surrender terms. On 14 Aug. Japan surrendered, and it was on that date therefore that the Second World War came to an end. The emperor issued orders for all Jap. forces to cease fire. At the same time Marshal Vassilevsky sent the Jap. Kwantung Army an ultimatum to surrender its arms by 20 Aug. By 17 Aug. Jap. forces had begun to surrender on sev. sectors of the Manchurian front. Hostilities in Bougainville ceased by 19 Aug. On 20 Aug. Lord Mountbatten, supreme allied commander of the SE. Asia Command, broadcast directions to F.-M. Count Terauchi, commander of the Jap. Southern Army, to send a representative with plenipotentiary powers to meet his chief of staff at Itanogoon, and the meeting took place there on 26 Aug. By 23 Aug. the Japanese in the Philippines were beginning to surrender in large numbers as the news of the capitulation reached the mt fastnesses.

*Russian Campaign in Manchuria.* In broad outline this whirlwind 16-day campaign, in which the Russian armies were under the supreme command of Marshal Vassilevsky, consisted in the envelopment of the 3 main Jap. fortified areas: the Hallar-Solun area in W. Manchuria, the Sungari-Sakhalyan in N. Manchuria, and the maritime area in E. Manchuria. Operations were planned to take every advantage of the superiority of Russian armour over Jap. anti-tank weapons. Attacking on a broad front in the E., Marshal Meretskov's forces came to grips with the main forces of the Jap. Third Army in the first days of the campaign by outflanking the frontier defence zone. From the N. Gen. Purkayev, by a wide manoeuvre to Mergen, surrounded the Jap. 123rd Infantry Brigade and blockaded the Sakhalyan defence zone. Up the valley of the Sungari other forces of Gen. Purkayev's command thrust towards Harbin. From the W. Marshal Malinovsky by-passed all Jap. positions W. of the great Khingan range by throwing armour forward in a spectacular advance. By 20 Aug. the Russians had conducted vast enveloping moves which

brought the whole of Manchuria from the borders of Inner Mongolia to the sea of Japan, and from the middle Amur to the Yellow Sea, within the grasp of their armies. Soon afterwards Russian airborne troops landed in the tns of Dairen and Port Arthur and began to disarm the garrisons. By the 23rd the Russians were in occupation of the whole of Manchuria, S. Sakhalin, and the Is. of Shumshu and Paramushiro in the Kurile archipelago. On that day the Jap. Kwantung Army, after unsuccessful counter-attacks, laid down their arms and surrendered to the Red Army.

*Allied Troops enter Japan.* Amer. airborne troops landed at Atsugi airfield, 18 m. from Tokyo, on 28 Aug. to prepare for the formal occupation under MacArthur. A huge armada of allied warships had now assembled off the coast of Japan. Four-fifths were Amer. ships, the rest mainly Brit., together with Brit. Dominion and some Dutch. Some 9 allied ships entered Tokyo Bay on the same date. The main landing of allied troops began the next day, airborne forces arriving in strength at the Atsugi airfield, while Amer. and Brit. marines disembarked at Yokosuka naval base. Meanwhile (30 Aug.) a strong Brit. naval force, under Rear-Adm. Harcourt, entered the harbour of Hong Kong. No actual instruments of surrender had yet been signed owing to the physical difficulties imposed by great distances and the fact that large numbers of Jap. forces were scattered over far-flung areas of the Pacific. But on 2 Sept. Jap. envoys, in the presence of 50 allied generals and other senior officers, signed the allied instrument of unconditional surrender aboard the Amer. battleship *Missouri* in Tokyo Bay, and immediately afterwards a convoy of 42 ships entered the bay and landed 13,000 Amer. troops for the march on the cap. There were other formal surrenders to be made in Luzon, New Guinea, the Solomons, Malaya, and Burma; but with the signing of the instrument of surrender on the *Missouri*, Japan had at last come to the end of her dream of conquest. MacArthur signed the surrender documents as supreme commander, Adm. Nimitz signed for the U.S.A., Adm. Sir Bruce Fraser for Britain, Gen. Hsu Yung-chang for China, Lt.-Gen. Kuzma Deevyanko for Russia, Gen. Blamey for Australia, Air-Vice Marshal Isitt for New Zealand, Gen. le Clerc for France, and Gen. L. H. van Oyen for the Netherlands. Mamoru Shigemitsu, former ambas. in London for the emperor, and Gen. Yoshijiro Umezui for the Jap. Imperial General Staff. Some 200,000 Jap. troops on various by-passed Pacific is. laid down their arms on 3 Sept. at 5 minor surrender ceremonies aboard Amer. warships in the SW. Pacific. These were Truk, naval strongholds in the central Carolinas, Palau, the Bonins, N. of Guam, Rota in the Marianas, and Pagan, N. of Saipan.

*British Forces enter Singapore.* Adm. Sir Arthur Power, commander-in-chief of the E. Indies Fleet arrived at Singapore on 3 Sept. with a Brit. naval force, Royal

Marines having taken over Penang the same day. Brit. and Indian troops landed at Singapore on 5 Sept.

The surrender in the SW. Pacific was signed on board H.M.S. *Glory* in St George's Channel, 28 m. SE. of Rabaul, on 6 Sept. Gen. Inamura, commander-in-chief in the SW. Pacific, handed his sword to Lt.-Gen. Sturdee, commanding the Australian First Army, and both he and Adm. Kusaka, commanding the Jap. fleet in the area, signed the surrender.

**Surrender in South-east Asia Area.** The official surrender in SE. Asia took place in the council chamber of the municipal buildings in Singapore. The Jap. representatives were Gen. Itagaki in place of Count Terachi, the supreme commander, and the commanders of the Jap. armies in Siam, Burma, and Singapore, and of the enemy fleets based on Singapore and Surabaya. At the head of the allied officers was Adm. Mountbatten, the supreme commander of the area, with Lt.-Gen. Slim, commanding the forces in the area of SE. Asia, Adm. Sir Arthur Power, Air Marshal Sir Keith Park, and Lt.-Gen. Wheeler, deputy supreme commander.

**Japanese surrender in New Guinea.** It was not until 13 Sept. that Gen. Adachi, commander of the Jap. Eighteenth Army, surrendered the Jap. forces in New Guinea to Maj.-Gen. H. C. H. Robertson, commander of the 6th Australian Div. Thus ended a long and arduous campaign in which the Australians encountered some of the toughest enemy forces in the Pacific. The Australians had succeeded the Americans in Nov. 1944, but for some time could only act on the defensive in New Guinea and in its satellite is. Bougainville. Wewak, garrisoned by 20,000 Japanese, was not taken until the end of March 1945, and the final offensive in Bougainville was not launched by the Australians until early in April. But by the end of July the Jap. 41st Div. had been virtually annihilated, while in Rabaul the Australians were effectively containing an enemy force of no fewer than 50,000 men.

**Burma and Hong Kong surrendered.** On the same day (13 Sept.) Gen. Ichida signed the instrument for the surrender of Burma to the Brit. Twelfth Army at Rangoon (see further BURMA, SECOND WORLD WAR, CAMPAIGNS IN). The Japanese in Hong Kong did not surrender until 16 Sept., though the R.N. had been in possession of the dockyard since 30 Aug.

**Japanese Atrocities.** The State Dept. in Washington lost no time in apprising the world of Jap. atrocities. The dept. on 5 Sept. pub. a long document containing the unsavoury story of 'Japan's barbaric torture and wanton murder' of Amer. prisoners of war and charging Japan with the violation of practically every law concerning the treatment of prisoners of war and internees.

See Adm. Sir W. M. James, *The British Navies in the Second World War*, 1946; Lt.-Gen. B. E. Lippincott and others, *From Fiji through the Philippines with the Thirteenth Air Force*, 1948; Lt.-Gen. A. E. Percival, *The War in Malaya*, 1949;

F. Spencer Chapman, *The Jungle is Neutral*, 1949; J. E. Cresswell, *Sea Warfare, 1939-1945*, 1949; Lord Mountbatten, *Report to the Combined Chiefs of Staff by the Supreme Allied Commander South-East Asia 1943-45*, H.M.S.O., 1951; Harry S. Truman, *The Truman Memoirs, Volume I*, 1955; Sir William Slim, *Defeat into Victory*, 1956; C. A. Willoughby and J. Chamberlain, *MacArthur: 1941-1951. Victory in the Pacific*, 1956.

**Pacific Girdle**, see under IGNEOUS ROCKS; VOLCANO.

**Pacific Ocean**, largest div. of the hydrosphere, extends from the Southern Ocean (lat. 40° S.) to Bering Strait, i.e. practically to the Arctic Ocean; it is, however, coextensive with the Southern Ocean to 80° S. lat.; it divides the Old and New Worlds, and is roughly bisected by 170° S. long.; greatest breadth, 10,000 m.; length, 7000 m. In shape it is very roughly pentagonal, very broken to the W. and SW., where it communicates with the Indian Ocean; it has an area of 63,634,000 sq. m., nearly 40 per cent of the whole water extent of the world. The temp. and salinity show no very marked abnormalities, though the P. O. is in general less saline than the others.

**Coast-line.** The coasts of America which meet the P. O. are steep and even, with fjord formation in the N. and S. Australia shows a somewhat similar coast, but the Old World presents a series of fringing seas with festooned is. enclosing them, and a much gentler slope of coast; the continental shelf is here more extensive. The drainage area is relatively small, only a little more than one-quarter that of the Atlantic, although the actual ocean surface is 1½ times as great. The terrigenous deposits are correspondingly small and nearer land, mostly covering the fringing seas. Red clay occupies about three-fifths of the whole area lying towards the E.; globigerina ooze, two-thirds of that in the Atlantic, occupies the intermediate depths towards the W. and off S. America.

**Depth.** The average depth of the P. O. is 14,000 ft. and it exceeds that of the other oceans; the W. is deeper than the E., and the N. than the S. Some of the great depths appear to lie up against the festooned is., e.g. the Tuscarora Deep (maximum 4685 fathoms), lying along Japan and the Kuriles for 400 m., and the Aldrich Deep, E. of New Zealand (maximum 5155 fathoms). The greatest known depth is 5940 fathoms (6½ m.), in the Marianas Trench 200 m. SW. of Guam, sounded in 1951 by the Admiralty survey ship H.M.S. *Challenger*. The Amer. *Cape Johnson* sounded the previous record depth, 5773 fathoms in the Mindanao Trench, in 1945.

**Islands.** The P. O. is notable for its large number of oceanic is. grouped in the central and W. regions; they are all volcanic or coral, many being atolls, and number over 2500, with an area of 70,000 sq. m. The P. O. is unique in its complete girdle of volcanoes on the continental coast and is., with accompanying manifestations of earthquakes.

**Currents.** Under the influence of the winds a clockwise swirl is formed in the N. Pacific; the waves produce a N. equatorial current along lat. 15°, turning N. by the Philippines, and joining irregular branches from the E. Indies and China Sea to form the Kuro Siwo, the Gulf Stream equivalent, at Formosa; this becomes a W. wind drift in lat. 45° N., branching opposite Vancouver to form S. the California current, N. a swirl following the Alaskan coast. A cold Arctic current enters from Bering Strait and circulates through the sea of Okhotsk and the Japan Sea, making the mainland coast ice-bound in winter. An equatorial counter-current is well estab. over the E. part, but less so in the W. In the S. Pacific the trades cause a S. equatorial current along the equator and to 15° S., branching very irregularly in its westward course, among the Is. to the W., and forming 4 distinct currents, turning southward to form the great anti-clockwise swirl. These unite in their eastward course about lat. 40°, to branch opposite S. Chile, N. forming the Peru current, S. joining the W. wind drift round Cape Horn.

**History.** Balboa sighted the P. O. from Panama in 1513. Magellan sailed through the strait bearing his name in 1520, and gave the name to the ocean. In 1577 Drake, the first Englishman to enter the P. O., sailed N. to California and across to the Moluccas. In the 17th cent. the Australasian region was explored, and a more careful and detailed extension of the work occupied the 18th cent. Many scientific expeditions were carried out during the 19th. Valuable contributions to the survey work of the P. O. have been made by the Jap. Gov., as well as by the U.S. oceanographical dept of the navy. For campaigns in the Second World War see PACIFIC CAMPAIGNS OF FAR EASTERN FRONT IN SECOND WORLD WAR. See also OCEAN; TERRA AUSTRALIS INCOGNITA. See Q. Brigham, *Index to the Islands of the Pacific*, 1900; T. R. Saint-Johnston, *South Sea Reminiscences*, 1922; F. Zorck, *Annalen der Hydrographie*, 1928; W. G. Ivens, *Island Builders*, 1930; G. E. R. Deacon, *Dynamics of the South Ocean*, 1937, and *Hydrology of the South Ocean*, 1937; J. W. Vandercook, *Dark Islands*, 1938; J. A. Williamson, *Cook and the Opening of the Pacific*, 1949; R. Gibbings, *Over the Reefs*, 1949; and bibliography of OCEAN AND OCEANOGRAPHY.

**Pacific Steam Navigation Company, see** ROYAL MAIL LINES LTD.

**Pactolus**, in ancient times the name of a brook in Lydia, Asia Minor, now called Sarabat. It rises in Mt Tmolus, and flows past Sardis into the Gulf of Smyrna. The golden sands of P. were proverbial, and to them legend attributed the wealth of Croesus.

**Pacuvius, Marcius** (220-c. 131 BC), the greatest of the Rom. tragic poets, b. at Brundisium. He was the nephew of Ennius, on whose style he modelled that of his own dramas, which were based on Gk originals. He also devoted some of his time to painting. He died at Tarentum.

See E. H. Warmington, *Remains of Old Latin*, II (text and trans., Loeb Library), 1936; W. Beare, *The Roman Stage*, 1950.

**Padang**, tn and port of Sumatra, Indonesia. It is on the SW. coast, and trades chiefly in coffee, tobacco, copra, hides, gold dust, and spices. P. is also a trade centre for coal mining and agricultural produce. Pop. 52,000.

**Paddington**, parl. and metropolitan bor. of NW. London, situated N. of the bor. of Kensington. The name means 'the settlement of Padda's people.' Until c. 1820 it was still a vil., but its choice as terminus for the Great Western Railway in 1832-8 brought rapid development. The P. Canal to Uxbridge was originally built 1795-1801, then in 1805 linked with the Grand Union Canal, finally extended to the Regent's Canal and thus to the Thames at Limehouse. The famous Shillibeer omnibus service from P. Green was opened in 1829. P. returns 2 members to parliament. Area 1367 ac.; pop. 125,000. See also BAYSWATER.

**Paddle-steamers**, forerunners of screw-driven steamships, are boats propelled by paddle-wheels, which are driven by steam. The use of boats with paddle-wheels dates from very ant. times, both the Romans and Egyptians being acquainted with some form of them; in later times R. Valturinus in his work *De Re Militari* (1472) records the use of paddle-boats. Dr Denis Papin, a native of Blois, suggested towards the close of the 17th cent. that his invention of a steam cylinder fitted with a piston could be applied to work paddle-wheels, but the idea does not appear to have been successfully carried out. T. Savery invented a steam-condensing system, which he claimed could be applied to ships; J. Hulls claimed that he was the actual inventor of the paddle-steamer, in which he used ideas of Savery and Papin, but his boat does not seem to have worked successfully. The *Pyroscop* of the Marquis de Jonffroy was successful in travelling up the Saône unaided in 1783, but no commercial success followed. The boat built by S. Moray in 1797, with 2 paddle-wheels, gave the best results experienced till then. In 1803 Robert Fulton made his first trip, and in 1807 Stevens built a paddle-steamer, the *Phoenix*, which plied for 6 years on the Delaware, whilst in the same year the *Clermont* of Fulton reached a speed of 5 m.p.h. on a trial trip. During the next decade the number of steamers on the Mississippi increased, and from 1835 the speed attained was greater. In Scotland Symington in 1802 built a stern-wheel steamer, but the *Comet* of Henry Bell, first built in 1804 and wrecked in 1820, was the first paddle-steamer employed regularly and successfully in Great Britain. P. have proved useful as minesweepers owing to their shallow draught. For the varieties of wheels see PADDLE-WHEEL. See R. Murray, *Marine Engineering and Steam Vessels*, 1852, and E. C. Smith, *Short History of Naval and Marine Engineering*, 1938.

**Paddle-wheel**, wheel used for propelling a boat or ship. As originally tried, it

consisted essentially of a series of paddles or paddle-like spokes inserted in an axle drum or wheel. The term was avoided by the 18th-cent. inventors and theorists, who spoke of a 'water-wheel,' a 'rowing-wheel,' 'revolving oars,' etc. The name P. gradually came into use after 1815. In its eventual development flat boards were fitted more or less radially round the circumference, so as to press backward like a succession of paddles against the water. Two wheels are generally used, one on each side of the vessel, a little aft of midship, so as to catch the tops of waves; in riv. steamers, where there is no great depth of water, one only, placed at the stern, is sometimes used. The floats of the earlier paddle-boats were fixed rigidly to the wheel. Later feathering P.s, in which each float is fixed to a pin at the back and connected at the centre of the wheel to a small eccentric device, were used. By this method the old 'churning of the water' is lessened. The use of paddles has been discontinued in favour of screws for cargo boats and ocean-going ships. The efficiency of the paddle is greatest at a certain constant immersion; and when draughts vary the level of floats must vary also. Rolling affects the paddles and strains the engines, as one paddle offers very great resistance while the other is racing. The speed of the floats depends on the diameter of the wheel; more breadth is required for vessels with paddles, as each paddle is about one-fourth of the breadth of the boat, but they are very suitable for excursion steamers, being fast, easily managed and started. See PADDLE-STEAMERS.

Paddy and Paddy Bird, see RICE and RICE BIRD.

Paderborn, Ger. city in the *Land of North Rhine-Westphalia* (q.v.), at the SE. foot of the Teutoburger Wald (q.v.), 90 m. ENE. of Düsseldorf. Charlemagne (q.v.) held the first Saxon parliament in P. in 777, and the city was the scene of a meeting between Charlemagne and Pope Leo III in 799. In the Middle Ages the city was a member of the Hanseatic League (q.v.). It was made a bishopric in 805, and is now the seat of an archbishop. Among its notable buildings are the cathedral (11th-13th cents.), the 11th-cent. Bartholomäus Kappelle, and the 17th-cent. Rathaus. There was a univ., 1614-1819. Cement and furniture are manuf. Pop. 47,000.

Paderewski, Ignacy Jan (1860-1941), Polish pianist, composer, and statesman, b. Kurylowka, in Podolia, son of a Polish gentleman farmer; studied at Warsaw and Berlin. Always remarkable for strong personal views as an artist, he developed his talent in his own way from the first, and such piano instruction as he received at Warsaw was merely part of the curriculum; and when, in 1876, he made his first public appearance, it was mainly with the purpose of introducing his own compositions (pieces in the form of Polish dances), which at that time he was not technically proficient enough to play more than passably well. He taught at

Warsaw and Strasburg, 1878-84. It was at Strasburg that he met the actress Modjeska, a gifted countrywoman of his, who persuaded him to become an interpretative artist, and he placed himself under Leschetizky in Vienna, 3 years' intensive work turning him into a finished executant. He appeared at Vienna, 1887; toured Germany, 1888; visited Paris, 1889; London, 1890; and America, 1891. He toured Europe extensively until his second marriage, in 1899, to Baroness de Rosen, afterwards devoting himself principally to composition, although he still played occasionally. He wrote some good piano music, especially his popular *Polish Fantasia* with orchestra; his opera *Manru* was produced at Dresden (1901) and New York (1902), and his *Symphony at Boston* (1909). His idol was his countryman, Chopin, in the interpretation of whose passionate, whimsical, and splenetic moods he was unapproached.

He was politically active in the cause of Poland during the First World War, and was first Prime Minister and Minister of Foreign Affairs of the Polish Republic, 1919-20. The idea of creating a Polish army outside Poland was his (1916), and with that aim he was sent to America as delegate of the Polish National Committee which had been formed in Paris. Soon after the armistice he went to London to seek help in reconstituting the new Polish state. His presence, subsequently, in Poznan at a time when there was danger of Poland having some association with Germany roused the Poles there to tremendous enthusiasm, and a revolt broke out which resulted in most of the prov. of Poznan being wrested from the Gers.; its transfer was confirmed by the treaty of Versailles. It was at the peace conference that he was at his best as a statesman; if he claimed less than his countrymen desired, he acquired for Poland the goodwill and confidence of the other delegations. He retired to his estate in California in 1920, and in 1922 returned with *celat* to the concert stage. P. received many honours, including, in 1925, the G.B.E. Univs. in all parts of the world conferred honorary degrees on him. Oxford made him D.C.L. and Cambridge Mus.D. See lives by E. A. Baughan, 1915; H. Opieński, 1929; R. Landau, 1934; C. Phillips, 1934; A. Gronowicz, 1943; and *Memoirs*, ed. by Mary Lawton, 1939.

Padiham, tn of Lanes, England, 3 m. NW. of Burnley. The inhab. are engaged in the manuf. of textile goods, engineering, furniture manuf., mining, etc. Pop. 10,000.

Padishah (*pad*, throne, and *shah*, sovereign), title assumed by the former sultans of Turkey and applied by E. peoples to European sovereigns.

Padova, see PADUA.

Padre Pio (1887- ), religious name of Francesco Forgione, It. Capuchin friar resident near Foggia, Italy. He is a stigmatic, marked with the 5 wounds of Christ, and is visited by pilgrims from many countries, especially the U.S.A. With their offerings a hospital has been

built on the most modern lines at San Giovanni Rotondo, near Foggia. See P. Carty, *Padre Pio the Stigmatist*, 1955. See also STIGMATISATION.

**Padstow**, seaside holiday resort and port of N. Cornwall, England, on the estuary of the Camel, 5 m. NW. of Wadebridge. Pop. 2400.

**Padua**, Duke of, see ARRIGIM.

**Padua**: 1. Prov. of Italy, in SE. Veneto (q.v.). It is part of the great N. plain of Italy, but contains the Euganean Hills (q.v.) in the W. It has a small outlet to the sea in the SE. on the lagoon of Venice (q.v.). The chief rvs. are the Brenta, Bacchiglione, and Adige (qq.v.), and there are many canals. The prin. tns include P., Este, and Monselice (qq.v.). The prov. is mainly agric.: livestock, cereals, rice, wine, and fruit are produced. Area 828 sq. m.; pop. 706,000.

2. (It. Padova; anct Patavium) It. city, cap. of the prov. of P., on the canalised part of the Bacchiglione, 22 m. W. of Venice (q.v.). Its origin is said to go back to the time of Troy (q.v.). It was sacked by Alaric I, and in 452 by Attila (qq.v.). In 1318 it came under the rule of the Carrarese, and in 1405 was taken by Venice. It was occupied by the Fr. in 1797, was ceded to Austria in 1814, and became part of united Italy in 1866. The 16th-18th-cent. cathedral has a baptistery dating from the 12th cent. The great Romanesque-Gothic Basilica of St Anthony (see ANTONY OF PADUA), the 6 Byzantine domes of which tower above the tn, contains the tomb of the saint; the high altar of the Basilica has bronzes by Donatello (q.v.), whose magnificent equestrian statue of Gattamelata stands in the piazza outside. In the little church of S. Maria all'Arena there are frescoes by Giotto (q.v.), and in the church of the Eremitani (restored after bomb damage during the Second World War) there still remain a few of the famous frescoes of Mantegna (q.v.). Other notable buildings of P. are the Palazzo della Ragione (12th-15th cents.), the 8-domed church of S. Giustina (16th cent.), and the celebrated Caffè Pedrocchi (1831). The univ. (1222) was a great seat of learning in the Middle Ages; among those who taught in it were Pietro di Abano and Galileo (qq.v.). P. has a botanical garden (1545) and a library (1629). The civic museum has a splendid collection of paintings. P. has a large trade in agric. produce, and has brewing, distilling, engineering, chemical, silk, confectionery, and furniture industries. Pop. 177,000. See C. Foligno, *The Story of Padua*, 1910 (Medieval Towns); G. Newman, *A Century of Medicine at Padua*, 1922; and H. la Farge, *Lost Treasures of Europe*, 1946.

**Paducah**, co. seat of McCracken co., Kentucky, U.S.A., 85 m. SW. of Evansville, Indiana. It is a hub of rail, river, and air transport, and the trade and industrial centre of W. Kentucky. It has shipyards and railroad shops, and manufs. clothing, textile machinery, shoes, radios, cooperage, and concrete products. It is the dark-tobacco market of the U.S.A. Pop. 32,828.

**Padus**, see Po.

**Paean**, the physician of the gods, but later Gk writers use P. as a title of Apollo in his aspect of healer. Later the word was a 'song of thanksgiving' and 'hymn of victory,' meanings derived apparently from 'Hall, Peaan,' an invocation to Apollo.

**Paedobaptists** (Gk for child, and baptist), those who practise infant baptism. Since this is the normal Christian practice, the term is rarely used. See also ANTIPAEDOBAPTISTS; BAPTISM.

**Paeslignan Dialect**, see LATIN LANGUAGE AND LITERATURE.

**Paenony**, genus of herbaceous and shrubby perennials (family Ranunculaceae) which includes some of the most magnificent garden flowers. The herbaceous kinds are the harder and are more widely cultivated than the shrubby tree of mt P.s. These, if grown out of doors, need protection from spring frosts; they are very valuable for gentle forcing under glass. *Paeonia mascula* is naturalised on Steep Holme in the Severn.

**Paer, Ferdinando** (1771-1839), It. composer, b. Parma, where he studied. He became *maestro di cappella* at Venice and began to compose operas at the age of 20. In 1798 he was invited to Vienna, where his wife was engaged at the It. Opera, and the next year produced his best work, *Camilla*, there. In 1803-6 he was conductor at the Dresden Opera, and in 1807 became *maitre de chapelle* to Napoleon I. He remained in Paris to the end of his life, directing the It. Opera in 1812-27. Historically the most interesting of his many operas is *Leonora, ossia l'amore coniugale*, 1804, an It. version of the libretto of Gaveaux's *Leonore*, of which that of Beethoven's *Fidelio* is in turn a Ger. translation.

**Paestum** (Gk Poseidōnia, modern Pesto), Gk colony in Lucania, S. Italy, situated near the bay which took its name from the tn (Paestanus Sinus—gulf of Salerno). It was founded by colonists from Sybaris about 600 BC. After the Lucanians had conquered the city it fell into the hands of the Romans, who, in 273 BC, also founded a colony there. After suffering at the hands of the Saracens during the 9th cent., and being partially destroyed during the 11th, it was eventually abandoned during the 16th cent. The ruins of 2 Doric temples at P. are among the most remarkable remains of antiquity. Although the battle of the Salerno beach raged all around them in the Second World War, the temples of P. escaped all damage. Indeed, the war actually helped archaeological interests, for, while digging a gun-emplacement near the site, Brit. troops came upon evidence of a prehistoric cemetery. Regular excavations were subsequently conducted under the auspices of the Neapolitan Museum.

**Paetus**, see THRASEA, PAETUS P.

**Pagan**, anct ruined city of Upper Burma, 92 m. SW. of Mandalay. From AD 849, when it was founded by King Pyinpya, to the day it was sacked by the barbarian hordes of Kublai Khan (q.v.) in 1287, it served as Burma's cap.



It is one of the archaeological wonders of the E. Perched on the 70-ft cliffs of the E. bank of the riv. stretch the shrines, monasteries, and bell-shaped pagodas of the city which make it a resort of Buddhist pilgrims. There are 5000 of these monuments still standing. The Brit. Fourteenth Army crossed the Irawadi near P. in Feb. 1945, in the advance against the Japanese in Mandalay, but fortunately P. was spared the ravages of war.

**Pagani, Gregorio** (1558-1605), It. painter, learnt his craft from Santo di Titi and Lodovico Cordi (Cigoli). A fine colourist, he helped to renew the inspiration of his native school of Florence. The 'Family of Tohit' and some frescoes in the church of Santa Maria Novella, which are his best-known works, are all in that city.

**Paganini, Niccolò** (1782-1840), It. violin virtuoso, b. Genoa, where he studied under Costa; later he worked also under Rolla and Ghirelli at Parma. Having put in a prodigious amount of technical practice, he began his actual career when 15 years old. For nearly 40 years, with some interruptions, he toured Europe with sensational success, amassing a very considerable fortune; but he did not visit England until 1835. After 1835 he lived in semi-retirement, dividing his time between Parma and Paris, where his gambling propensities led almost to his ruin (1836). He is remembered chiefly for his wonderful technique, his double-stopping and harmonics being unsurpassed, as were also his roundness and beauty of tone in soft passages. But his dissolute character and general lack of refinement marred his interpretations, and his virtuosity too often led him into extravagance. As a composer for string instruments (including the guitar) he produced work of distinctive character. See life by J. Pulver, 1936.

**Paganism** (Lat. *paganus*, countryman), name given first to the polytheistic religions of the Greco-Roman world by the early Christians because the country folk were the last to abandon the ancient beliefs and practices. It is probable that the earliest manifestation of religion was monotheistic and that P. arose from a tendency in primitive man not only to distinguish the divine attributes but also to deify natural phenomena. These phenomena are easily recognisable in the familiar deities of Greece and Rome. The anthropomorphic character of the pagan gods led inevitably to the exaltation of human passions. The Jews were the first to recognise the intimate link between P. and amorality, and the denunciations of it in their law and prophets are summed up in the magnificent epistle of St Paul to the Romans. See M. A. Beugnot, *Histoire de la destruction du paganisme en Occident*, 1835; E. de Pressenac, *The Ancient World and Christianity*, 1888; and F. C. Conybeare, *Myth, Magic, and Morals*, 1909.

**Page, Sir Earle Christmas Grafton** (1880- ), Australian statesman, b. Grafton, New South Wales, member of the house of representatives for Cowper, New South Wales, since 1919. P. served in the Australian Imperial forces in the First

World War, entered Parliament as a member of the newly formed country party in 1919, was leader of the party, 1920-39. As deputy Prime Minister and Treasurer in the nationalist country party coalition gov., 1923-9, and chairman of the Australian loan council, 1924-9, he was able to exert considerable influence on economic development and to achieve a settlement of commonwealth state financial relations on terms which were to increase the commonwealth power considerably. In the coalition gov. in the thirties he held the important offices of minister for commerce, 1934-9, 1940-1, and minister for health, 1937-9, and was leader of the Australian trade delegations to the U.K., 1936-8. Sev. times acting Prime Minister, he was Prime Minister of the commonwealth for a short period in 1939. P. was Australian representative in the Brit. war cabinet 1941-2. When the Liberal country party gov. was formed in 1949, P. became minister for health again, retaining that office until 1955.

**Page, Sir Frederick Handley** (1855- ), aeronautical pioneer, and inventor of the slotted wing for aircraft. He was one of the early pioneers of flying, and founded Handley Page Ltd in 1909. In 1908 he joined the Royal Aeronautical Society, and was its president from 1945 to 1947. In the First World War P. designed and built the heavy bomber, the world's first multi-engined aircraft, and in 1919 he was running a civil aircraft service to the Continent. Under his direction Handley Page Ltd became one of the leading aircraft manufacturers, and provided 65 per cent of the Imperial Airways fleet when the two concerns were merged in 1924. His H.P. 42 airliner was an outstanding machine in the 1930's. During the Second World War Handley Page Ltd produced the Harrow, Hampden, and Halifax bombers, and the Hastings military transport. Among P.'s other designs are W's, Hannibals, and Hermes, and recently the giant Victor jet bomber.

**Page, Thomas Nelson** (1853-1922), Amer. author and diplomat, b. Oakland, Hanover co., Virginia. He practised law at Richmond, 1875-93, and was ambas. to Italy, 1913-19. His literary work after the First World War showed an intense admiration of Italy. His pub. include *In Ole Virginia*, 1887, *The Old South*, 1891, *Marse Chan*, 1893, *Pastime Stories*, 1894, *The Old Gentleman of the Black Stock*, 1896, *The Negro—the Southerner's Problem*, 1904, *Robert E. Lee*, 1911, *Life of Thomas Jefferson* (in It.), 1918, *Italy and the World War*, 1926. He will live in Amer. literature by his charming sentimental stories of Virginia, in which the protagonists are the plantation owners and their devoted slaves and body servants. He was one of the first and most successful in employing negro dialect. See R. Page, *Thomas Nelson Page, a Memoir of a Virginia Gentleman*, 1923.

**Page**, youth of noble or gentle birth who waits on royal and noble personages. In the days of chivalry, that is, down to the 15th cent. a boy desirous of becoming an esquire and afterwards a knight

served an apprenticeship as P. at court or in the castle of some nobleman. The modern P.s of honour or P.s of the presence, etc., who are attached to royal households and who figure on ceremonial and state occasions, are not unlike the *pueri paedagogiani* who served the Rom. emperors.

**Pagellus**, well-known genus of the family Sparidae, belongs to the sub-div. *Pagrina*, in which the members have a single series of long front teeth and rounded molars on the sides of the jaw. The species live in the warmer seas; all are carnivorous, and many are edible. *P. centrodonatus* is the common sea-bream, and may be found in Brit. waters.

**Pagenstecher, Hermann** (1844-1932), Ger. ophthalmologist, b. Langenschwalbach, brother of Alexander P. (1828-79), founder of the Wiesbaden Eye Hospital (1857). Educ. at Wiesbaden and at the univs. of Würzburg, Berlin, and Prague, in 1868 he was assistant at the Univ. Hospital of Greifswald, and in 1869 at the Wiesbaden Eye Hospital. At his clinic in the Taunusstrasse he received patients from all over the world, effecting many remarkable cures. Queen Victoria, the Empress Frederick, and many other royal persons were among his patients, but he made no distinction between the rich and eminent and the poorest patient, treating all alike with the same degree of skill and care. P. wrote many essays on professional subjects, his *Atlas of the Pathological Anatomy of the Eye*, 1873-9, being the best known.

**Paget, Henry William**, see ANGLESEY, FIRST MARQUESS OF.

**Paget, Sir James** (1814-99), surgeon, b. Great Yarmouth, Norfolk, entered St Bartholomew's Hospital in 1834. Here, while still a student, he discovered *Trichina spiralis*, the cause of trichinosis. He qualified in 1836, and 3 years later was appointed demonstrator of morbid anatomy at St Bartholomew's, proving a very popular teacher. In his early years he did a considerable amount of medical and other journalism to augment his meagre income. He was appointed assistant surgeon to St Bartholomew's Hospital in 1847 and full surgeon in 1861. He was elected a fellow of the Royal Society in 1851, and in the same year commenced practice as a surgeon, with phenomenal success. He maintained his interest in physiology and was a great surgical pathologist. He was created a baronet in 1871 and appointed serjeant-surgeon to the Queen in 1877. He was president of the Royal College of Surgeons in 1874 and vice-chancellor of London Univ., 1884-95. Two diseases are named after him—Paget's disease of the nipple (eczema with subsequent cancer) which he described in 1874, and osteitis deformans (a disease of bone) described in 1876. His works include *Lectures on Tumours*, 1851; *Lectures on Surgical Pathology*, 1853; and *Clinical Lectures and Essays*, 1875. He prepared the catalogue of the pathological specimens at the Royal College of Surgeons in 1842. See *Memoirs and Letters of Sir James Paget*, by S. Paget, 1901.

**Pagi Islands**, 2 is. belonging to the Mentawi chain, off the W. coast of Sumatra. They are of volcanic origin, and have an irregular surface, which is densely wooded. The chief products are coconuts, sago, trepang, and timber. Pop. 5000.

**Pagnol, Marcel** (1895- ), Fr. playwright and film director, b. Aubagne near Marseilles. After studying in Marseilles, he became a teacher of English in S. France, and from 1922 in Paris, but left his profession soon afterwards and took up writing for the stage. After his first success *Topaze*, 1928, a satire, he produced a trilogy of plays on Marseilles characters, *Marius*, *Fanny*, and *César*, 1929-36, which were made into films. Turning from play-writing to film-producing, P. founded a film company and started editing a review called *Les Cahiers du film* for the advocacy of his ideas on the art of the cinema. He stressed the importance of dialogue and simplicity in films. His films include *Merlusse*, 1935, *La Femme du Boulanger*, 1938, *La Belle Meunière*, 1947, *Manon des Sources*, 1952, *Judas*, 1953, *Lettres de mon Moulin*, 1954. P. was the first film producer to be elected to the Académie Française in 1946. His trilogy was revived in 1954 as a Broadway musical entitled *Fanny*. See P. Brisson, *Le Théâtre des Années folles*, 1943, and R. Lalou, *Le Théâtre en France depuis 1900*, 1951.

**Pagoda**, Portuguese word, a corruption of the Sanskrit *dagoba*, which means a tomb shrine. It is a term used in the E. for a temple where the relic of Buddha is enshrined. There is a very handsome and massive P. at Tanjore, the upper portion being an elongated and elaborately sculptured pyramid 100 ft. in height. The most imposing and, at the same time, the most holy of the Burmese P.s is the Shway Gagon P. at Rangoon. The Siamese *phra* is either pyramidal with a cylindrical turret, or bell-shaped with a slender spire. Unfortunately the marvellous Chinese P., known as the Porcelain Tower of Nanking, was destroyed by the Taipings in 1866. The P. belonging to the temple of Horiuji in Japan has only 5 storeys; large ones have as many as 13.

**Pagodite**, see AGALMATOLITE.

**Pago-Pago**, harbour of the is. of Tutuila, Amer. Samoa, which nearly bisects the is. It was ceded to America in 1872 for a coaling station. It is one of the best harbours in the South Seas, and until 1951 was a U.S. naval station.

**Pagus Aurelianensis**, see ORLÉANAIS.

**Pahang**, state of the Federation of Malaya, until 1946 one of the 4 states known as the Federated Malay States under Brit. protection. It lies entirely on the E. side of the main range and has 130 m. of its E. border on the China Sea. It comprises 13,820 sq. m. The major portion of P. is fairly flat, though varied with low hills, but on the SW., W., and NW. there is a mountainous chain separating P. from Selangor (q.v.) and Perak (q.v.) and rising to a height of over 6000 ft. in the area called the Cameron Highlands. On the N. range separating P. from

Kelantan (q.v.) and Trengganu (q.v.) the highest peak, Gunung Tahan, reaches 7186 ft. The country is fairly well intersected with rivers and streams, the longest being the P. R. (over 200 m.) which, as the Telom, rises in the hilly regions of the NW. and, fed by many tribes, the largest of which are the Tembeling, Jelai, and Lipis, flows first in a southerly direction, through the middle of the state, and thence in an easterly direction, and has its outlet at Pekan on the E. coast. The state includes the is. of Tioman, some 25 m. off the coast in the China Sea. The seat of gov. is at Kuala Lipis. The sultan resides at Pekan, near the mouth of the P. R. The country is rich in gold, tin, and galena, and produces fine specimens of mats, baskets, etc., woven from pandanus fibre. The dynasty that once ruled P. was descended from the rulers of the royal house of Malacca, and before that house became extinct in 1699 its P. branch provided many rulers for the older throne of Johore, which directly represented the Malacca dynasty (see MALAYA, *History*). Thereafter P. came under the suzerainty of the new sultans of Johore who, when they removed to Rhio and Lingga (is. states S. of Singapore), left a member of their own house as *dato' bendahara* in charge of P. In 1887 Sir Frederick Weld negotiated a treaty with the bendahara, promising Brit. help in the event of external aggression and arranging for a Brit. agent to be stationed at his cap. At the same time the title of sultan was substituted for bendahara. In 1888 the sultan applied for and obtained Brit. protection, and the appointment of a resident. The present sultan came to the throne in 1932. P. was invaded by the Japanese in Jan. 1942 and the Brit. forces, outnumbered, withdrew from the Kuantan area (6 Jan.) after flooding the large P. Consolidated tin mine. Pop. 295,000. **Fahari**, see INDO-EUROPEAN LANGUAGES.

**Fahlavi**, or **Bandar Pahlavi**, dist. and port of Persia, situated on the Caspian Sea. The port was formerly called Enzell. Pop. of dist. c. 40,000; of port c. 25,000.

**Fahlavi**, Middle Persian, or Middle Iranian, terms employed for the dialects and scripts used in the ter. of Persia, or Iran, under the Arsacid and Sasanian dynasties (see PERSIA, *Language and Literature*). The term P., which is a phonetic modification of *Parthawi* or *Parthava*, as on the inscriptions of Darius, meaning 'Parthian' (Gk *Parthiatoi*, Lat. *Parthi*), does not indicate that P. was the language of the Parthians, but that both the speech and the script developed in Parthian times, i.e. when Parthia dominated Iran, and Iranian and Parthian became practically synonymous terms.

Alexander the Great's conquest of Persia in 331 BC not only put an end to the Achaemenian dynasty of Persia and to its script (cuneiform writing, q.v.), but also dealt a heavy blow at its religion (Zoroastrianism), its language (Old Persian), and its national culture. In the troubled years which followed the collapse

of Alexander's empire there arose the Arsacid dynasty of Parthia, while the language of Persia had undergone considerable modification and new scripts were devised. The ultimate decline of Parthian power helped the renaissance of the Persian national spirit, which found expression, in AD 226, in the founding of the Sasanian dynasty: while the Arsacid dynasty was considered to be foreign, the Sasanids rated themselves as a national dynasty, and their founder, Ardashir or Artakhshir (in graced form, Artaxerxes), traced his descent from the Achaemenians. The Sasanids, following the tradition of their great 'ancestors', immortalised their deeds in rock sculptures, and inscriptions written in P. Until the Arab invasion of Persia there must have been considerable production of P. literature, particularly on subjects connected with Zoroastrianism. The destructiveness of the Muslim conquest and the imposition of the Arabic alphabet on the newly converted Persians account for the fact that comparatively few P. works have survived. For this survival we are indebted to the Parsees, the descendants of the Persian Zoroastrians, who were compelled to flee to India in the 8th cent. AD. Indeed, the study of P. was stimulated in 1871 by the discovery of 52 P. writings in the library of a Parsee high-priest in Bombay. Since then many more MSS. and inscriptions have been found. The surviving books owe their preservation to their religious character or to their connection with the Avesta (i.e. the Zoroastrian sacred literature), written in an Old Persian dialect, now called Avesta, and in a most cursive script (probably of P. origin) of 50 signs, also termed Avesta. The book Avesta (q.v.) is invariably accompanied by the Zand, which is the traditional commentary of the Avesta, and is written in P. While the origin of the P. forms of speech is more or less clear, being a natural development of Old Persian dialects, it is far from clear how the P. systems of writing developed. They cannot have been creations of an individual, because in that case the P. script would have been more consistently worked out, and the almost contemporary appearance of 2 or more varieties would be inexplicable. It may, therefore, be assumed that the P. scripts were a natural development from local cursive Aramaic scripts (see ALPHABET). At least 3 varieties of the P. alphabets are distinguishable: (1) the NW. P., termed also Pahlavik or Arsacid, the script of the Parthians; it appears on coins and gems of the Arsacid dynasty; (2) the SW. P., termed also Parsik or Sasanian, the script of the Persians proper; it appears in 2 forms, monumental (on the Sasanian inscriptions) and cursive (of the P. books); (3) the E. P., of which only a cursive form is known.

**Paiforce**, officially the Persia and Iraq Command, a force which came into existence in April 1941 at about the time of the Iraq rebellion (see IRAQ, *History since 1914*), its purpose being to check a possible move by the Nazis to conquer the Middle E. In

the nature of things, thus early in the war, large forces could hardly be created by the Allies at a moment's notice, and the nucleus of P. was a single brigade and a field regiment of Royal Engineers. The force expanded and contracted according to military exigencies and, again according to exigencies, changed its role. After Syria had been occupied by the Allies and Iraq recovered, P. went into Persia and prepared to meet a Ger. attack either through Turkey or via the Caucasus or both. When that threat had vanished, P. became the indispensable link with Russia, and responsible for the deliveries of war material to the Red Army. This Russian 'lift' was in fact the chief achievement of P., and is described in a Stationery Office book (with illustrations) issued in 1949.

Paignton, popular seaside resort of Devonshire, England, on Torbay, 2½ m. SW. of Torquay. Among places of interest are the remains of the bishop's palace, once the residence of Miles Coverdale, translator of the Bible into English; and Oldway Mansion and gardens, once the home of the Singer family, now the town's civic centre. Pop. 25,369.

Paiho (white riv.), riv. of N. China, rises near the Great Wall, N. of Peking, on the slopes of the Mongolian Mts, and flows generally SE., past Tientsin, to fall into the Gulf of Chihli at Taku, after a course of 350 m. It is connected by the Grand Canal or Yun Ho with the Hwang-ho and Yangtzekiang. There is a bar of stiff clay at its mouth which greatly detracts from its value as a waterway, and its waters are thick with silt, but it is navigable by steamers as far as Tientsin and by native boats to T'ung-chou. Its largest trib. is the Hung-ho. See TAKU.

Pain, Barry Eric Odell (1864-1928), humorous author, b. Cambridge. He was educ. at Sedbergh and Corpus Christi College, Cambridge. A story of his, entitled 'The Hundred Gates,' appeared in the *Cornhill Magazine* in 1889. After leaving college he went to London, took to literature as a profession, and became known as a clever and humorous writer of fiction. His works include *Eliza*, 1900, *Eliza Getting On*, 1900, *The Memoirs of Constantine Dix*, 1905, *Wilhelmina in London*, 1906, *The New Gulliver*, 1913, *Me and Harris*, 1916, *The Problem Club*, 1919, *If Summer Don't (parody of If Winter Comes)*, 1922, *Dumphy*, 1927, and *The Later Years*, 1927.

Pain, see EMOTION; THERAPEUTICS; TOUCH.

Paine, Thomas (1737-1809), author and politician, the son of a small farmer at Thetford, Norfolk. He became an excise officer in 1761, but, agitating for the removal of grievances, was dismissed from the service. In 1774 he went to America with a note of introduction from Benjamin Franklin, and 2 years later pub. *Common Sense*, in which he discussed the causes of the war with England. He held various posts in the Amer. Army and under the Amer. Gov. until 1787, when he returned to England. In 1791, in reply to Burke's *Reflections on the French*

*Revolution*, he pub. the first part of *The Rights of Man*, and when a year later he issued the second part he had to flee to France to escape prosecution. He was at once elected a member of the Convention, in which (1793) he opposed the execution of Louis XVI, and was imprisoned until the death of Robespierre. He pub. *The Age of Reason* in 1794. He went again to America in 1802, to find neither welcome nor even charity, and died 7 years later in New York. His writings were forcible



THOMAS PAINE

enunciations of the abstract rights of man, and were highly regarded by the Radical party in England. See lives by C. Cohen, 1945; W. E. Woodward, 1945; H. M. Fast, 1946; and J. Dos Passos, 1948.

Painlevé, Paul (1863-1933), Fr. statesman, b. Paris, was successively prof. at Lille Univ. and the Sorbonne, and in 1904 prof. of mechanics and engineering at the Ecole Polytechnique. He wrote a book on aeronautics, which is recognised as a classic, and founded the Fr. Air League. A Socialist deputy in 1906, as chairman of the Navy Committee he initiated the policy of concentrating the Fr. fleet in the Mediterranean, and thereby promoted the development of the Entente Cordiale; minister of public instruction, 1915, and war minister, 1916, he was responsible for appointing Pétain, with Foch as chief of staff, to succeed Nivelle. Prime Minister for a few months in 1917, he was defeated as a candidate for the presidency in 1924, but became Prime Minister again in 1925, and also finance minister. He held a number of other ministerial posts between 1926 and 1932. He wrote many philosophical and scientific works, including a book on the analytical theory of differential equations. See life by E. Charles, 1925.

Painted Lady (*Vanessa cardui*), butterfly of the family Nymphalidae, migrates from Britain from N. Africa. The caterpillar breeds on thistles and other plants.

**Painter's Colic**, *see* COLIC; LEAD POISONING.

**Painting**, in art, may be defined as the imitation or representation of objects by colour laid upon a uniform surface.

**PRIMITIVE MAN.** Primitive P.s. largely to secure food by magic intent, were made by Palaeolithic man on the walls of his caves. Cave-paintings in France and in Spain are of special interest. These P.s. executed in little more than red and black, as records of animals in movement and as drawings, have never been surpassed. The artists had remarkable qualities of vision, feeling for mass, rhythm, and expressive line. Though many outlines may better be termed 'drawings,' the studies of Henri Breuil (q.v.) indicate that the cave artists used brushes of various sizes and kinds. The P.s. while near perfection in themselves, are scarcely related to each other. Possibly they were made for religious as well as for magical purposes, and to convey practical information in connection with hunting, and possibly also because to make them gave pleasure to the artist. Their strength and delicacy, feeling for line, tone, and movement, make a curious link with the sophisticated modern art of Western Europe.

**PAINTING IN ANTIQUITY.** In primitive form the existence of this art may be traced among the earliest known civilisations, as in Babylon, Egypt, India, Mexico, and Greece. Painted tiles, bas-reliefs, and statues have been found. Historical wall-paintings, especially on the walls of tombs, were common among many early races. The wooden cases of the Egyptian mummies were brilliantly coloured, as may be seen from the specimens in the Brit. Museum, and the P.s. on the walls of the Etruscan tombs are also famous. There is some ground for believing that the art of P. in Greece may have been brought to the same degree of perfection as the arts of sculpture and architecture, though probably lacking in any feeling for perspective, linear or aerial. It was not an independent art in its beginnings, but subservient to sculpture, architecture, or primitive engraving. Hard and definite linear drawing filled up with colour marked the first attempts in the grand art, which has since been developed both technically and intellectually to express infinitely more than mere outline. Egyptian art was intended more as a decoration, a record, and a symbol than as an imitation of nature, and probably Assyrian and Babylonian P.s. had the same aim. Later on a faithful representation of nature became one of the most important results the painter desired to achieve; while according to modern ideas something far higher and more elusive than mere resemblance to, or imitation of, external nature—the delineation of the inner soul by the artist's sympathy and insight—must be added to beauty of composition, arrangement, and detail to constitute a truly great picture. The Egyptians apparently knew a variety of pigments, while the Greeks, at least till the time of Apelles, used mainly 4—white,

red, yellow, and black (perhaps including blues). The designs on Gk vases and pottery are the prin. means left to us for forming any estimate of the art of P. among the Greeks. The discoveries at Mycenae, Crete, round the Aegean, and elsewhere by Sir Arthur Evans and others have also made important additions to our knowledge. To Cimon of Cleonae (c. 6th cent. bc) was ascribed, among other innovations, the introduction of 'catagrapha' (foreshortenings?) and an attempt to apply the rules of perspective. Polygnotus of Thasos, who settled at Athens



British Museum

SPHINX, SLAB FROM CAERE

about 563 bc, was one of the greatest masters of antiquity, and was praised by Aristotle, Pliny, and Pausanias. To his 'Athenian school' succeeded those of Ionia and Sicily, among the chief names being those of Parrhasius, Timanthes, Zeuxis, Pamphilus, and Apelles (5th and 4th cents. bc). The remains of early Rom. art are more abundant. After the sack of Corinth by Mummius (146 bc) many fine works of art were brought to Rome and exhibited. Valuable wall-paintings based on Gk originals have been excavated from the ruins of Pompeii and Herculaneum, the baths of Titus, and other noted buildings in Rome.

The introduction of Christianity marked a new period in the hist. of P. With it the purely decorative representations of mythology were superseded by the symbols of Christianity. Pictorial expression was made to serve a double end—that of

commemorating Christ's Passion, and of keeping the truths of the Christian faith alive in the hearts of the early catechumens. Thus in the catacombs one finds constant repetition of symbols such as the Lamb, the Good Shepherd, and others, which, while being purposely unintelligible to the uninitiated, held for the initiate encouragement and hope. Later, after the official estab. of Christianity in the reign of Constantine, the great pagan basilicas turned into Christian churches were decorated with mosaics, mostly of a symbolical character, or with figures of the Trinity and the saints, such as are to be seen still in the churches of S. Maria Maggiore, S. Giovanni Laterano in Rome, and those of Ravenna (see separate *tas*). To this period belong also sev. illuminated MSS. and images after the style of the Russian *ikons*, all of which betray Byzantine influence and manner of expression. After the 8th cent. fresco P. was introduced, and took the place of the mosaics, and, while affording a wider scope to the imagination, continued for some time to be tied down by the old tradition, both in composition and in design.

To make the course of European P. clear we must then first reckon with Byzantine art, which implies the products of the Christian culture centred in Byzantium (Constantinople) between AD 330 and the arrival of the Turks in the 15th cent. Gk and E. influences both had a part in it, and a rigidly conventional style was the result, found in Greece, the Gk islands, the Balkans, and spreading on the one hand to Russia, on the other to Italy. This form of P. had a long separate existence. Thus a remarkable exhibition at the Tate Gallery, 1953, showed the vitality of Byzantine P. in Yugoslavia between the 11th and 14th cents. El Greco (1541-1614) was trained in Crete in the Byzantine style in the 16th cent.

**ROMANESQUE.** A related but more westerly development was that of the Romanesque—a word applying equally, like many later descriptions of European art, to architecture, sculpture, and P. Romanesque P. may be arbitrarily dated from c. AD 1000 to c. 1250. The painter worked for the Church, producing frescoes, formal and monumental in style; and examples are to be found in the Teutonic lands, France, and N. Spain.

**GOTHIC PAINTING** (c. 1150-c. 1500) gradually evolved from Romanesque. Gothic, in the main, was a style belonging to NW. Europe, and its principal products were to be found in France, Germany, England, and to some extent in Spain. Burgundy and Flanders were two great centres. The enlargement of the windows in the Gothic church had a great effect on P., limiting the art of fresco and encouraging the production of painted portable panels. Another cardinal influence was the demand for and output of missals and 'books of hours,' ornamented with painted miniatures. Thus early Flem. P., so wonderfully represented by Jan van Eyck (c. 1390-1441), owes its minute detail, individual characterisation, and sense of colour to the Franco-Flem.

school of miniaturists which flourished at the end of the 14th cent. In Italy, as in the N. countries, the introduction of the painted panel marked the beginning of a reaction against the stiff Byzantine tradition. On the other hand, the practice of fresco P. was not affected by architectural styles such as the N. Gothic, and in the creation of the wonderful It. school this long and steadily continuing tradition must be reckoned with. By unhurried stages, the It. painters advanced to technical perfection and mature expression—which makes it hard to assign a definite date to the Renaissance art which is Italy's glory. In P. the first notable signs of an effort to replace the Byzantine convention by a more natural style are to be found in the work of Duccio di Buoninsegna at Siena and Cimabue (1255-1315) at Florence, but the first really great master was Cimabue's follower at Florence, Giotto (1267-1337). Giotto's frescoes at Assisi, Padua, and in the church of St Croce, Florence, were a new type of creation, in their science of composition and colour and their natural and dramatic presentation of sacred subjects, and his influence dominated Florentine P. until the end of the 14th cent.

**RENAISSANCE PAINTING**, centred in Italy, may be dated from c. AD 1400 to c. 1600. It had many ingredients, and can be divided into distinct phases. It was, first, the product of a scientific spirit, a desire for knowledge, and of full mastery of the artist's means. A study of the human figure (inspired also by the return to Greco-Rom. ideals of beauty) was one aspect; Antonio Pollaiuolo (1432-98) will serve as an example of the new anatomical study in P. Perspective, foreshortening, and the rendering of movement were all problems to solve, and the study of perspective is exemplified in Paolo Uccello (c. 1400-75). Armed with full technical equipment and knowledge, painters were able to express a greater range of thought and feeling than before. The full and truly astonishing fruition of Renaissance P. is found in what may be called the Middle period, c. 1500-30, the period of Leonardo da Vinci (1452-1519), Raphael (1483-1520), Michelangelo (1475-1564), Giorgione (1477-1510), and Titian (c. 1477-1576). Profound subtlety ('Mona Lisa'), majestic beauty (Raphael's 'Stanze'), sensuous beauty (Giorgione's 'Tempest', Titian's 'Sacred and Profane Love'), power and drama (Michelangelo's Sistine Chapel), were its product. The almost bewildering richness of the It. Renaissance stemmed also from the great number of regional and city-state 'schools' of P., fostered by art-loving princes. Florence, Siena, Umbria, Verona, Venice, Parma, all had their groups of masters and assistants, while Rome drew from each region some of its choicest talent. Rome until the 19th cent. was to be the great centre of European P., though meanwhile the influence of the It. Renaissance spread elsewhere in Europe. The late Renaissance (c. 1500-1600) is marked by 'Mannerism,' an attempt to combine the varied excellences of the masters;

Annibale Caracci (1580-1620), founder of the Eclectic School at Bologna, is an example.

EUROPEAN PAINTING. Surveying European P. as a whole at this point two main factors must be taken into account. One is the rise of oil-painting; the other the growth of distinct national schools. The discovery of the oil method and the use of varnishes are commonly assigned to the Van Eycks in the early 15th cent., and this process was introduced from Flanders into Italy by way of Venice, Florence, and

(1471-1528), express respectively the 'Old German' or medieval and the Renaissance spirit. The Thirty Years War brought German P. to an abrupt end. Flanders, after its early flowering with Van Eyck, Van der Weyden, and others in the 15th cent., had a second more racially distinct school dominated by the genius of Rubens (1577-1640). Holland, which during the early cent. had few representatives of any note, entered a great period of art in the 17th cent., when it achieved independence, with a host of painters of an essentially



SIR ANTHONY VAN DYCK: 'THE CHILDREN OF CHARLES I.'  
SEVENTEENTH CENTURY  
Turin Gallery.

Naples. It soon became the favourite medium throughout Europe as needing less speed and decision than fresco and admitting of retouching and correction. In addition, it opened fresh aesthetic possibilities. One was richness of colour, obtained by successive glazes, as in the work of Titian. Another was its value in rendering effects of light and shade. Thus we find Caravaggio (1573-1610) exploiting powerful contrasts under artificial lighting, and in the 17th cent. the perfection of a characteristically oil technique, by Rubens, Rembrandt, and Velázquez. The growth of national schools was bound up with the growth of nationalism, or of favourable conditions in a particular region. German P. reached its height at the beginning of the 16th cent. Its 2 greatest representatives, Matthias Grünewald (c. 1460-1528) and Albrecht Dürer

national or local type and, in Rembrandt, a universal genius. Spain achieved a singular eminence in this cent., the quality of a few great masters, El Greco first (1545-1614), then Velázquez (1599-1660), Murillo, and Zurbarán, exerting a great influence which has continued to modern times.

France, like Italy, developed steadily in P., keeping an equipoise between N. and S. (or It. and Flem.) influences which its geographical position helps to explain. As a Lat. country it shared the inheritance of Italy. The figure painters of the age of Louis XIV closely followed the methods of Raphael, as may be seen in Lebrun (1619-90). Nicholas Poussin (1594-1665), who spent most of his life in Rome, was steeped in the spirit not only of the It. Renaissance but also of classical antiquity. On the other hand, the attachment of

Claude of Lorraine to landscape was N. in origin, and the influence of Rubens on Watteau (who came from Valenciennes) was appreciable. With the great exceptions of Poussin and Claude, the age of Louis XIV found expression in decorative P. below the level of greatness. A native grace and charm combined with technical mastery make the succeeding age more typical, with Watteau, Boucher, Fragonard, and Chardin.

England, for various reasons, came late into the field, but in the 18th cent. developed a great and truly national school which begins with Hogarth (1697-1764). Its characteristics were the rejection of artificiality and pomp; an interest in social life of every kind (appearing in Hogarth's studies of modes and manners); paintings of animals and sport; and an agreeable informality in portraiture which both Sir Joshua Reynolds and Thomas Gainsborough display. The realism of the Dutch painters had great influence, especially in fostering landscape, perhaps the greatest Eng. achievement in P. Wilson, Gainsborough, Crome, Constable, and Turner raised oil-P. to magnificent heights. Parallel was the growth of a school of water-colour unique in European art in which the names of A. Cozens, J. R. Cozens, Turner, Girtin, Cotman, and Rowlandson (both in landscape and social comment) are illustrious.

**BAROQUE.** In spite of the many interesting differences of national character shown in the rise of national schools, it remains true that in European P. certain main currents pursued an international course. Thus it is possible to speak of Baroque P., apart from nationality, as a trend existing between c. 1600 and c. 1750. It was, in one sense, a kind of propaganda for both the religious and temporal power, and aimed especially at striking and grandiose effect. Rubens's vast mural P.s, e.g. the Marie de Medicis cycle, serve as an outstanding example.

**Rococo.** To this succeeded Rococo P. (c. 1730-70), less serious in mood and aiming at decorative charm. Boucher in France is typical, and in Spain the style is exemplified by Goya's early painted designs for tapestries. It came abruptly to an end with the Fr. Revolution and the great changes that heralded the 19th cent.

**NEO-CLASSICISM AND ROMANTICISM.** As a whole the 19th cent. presents a curious contrast between the kind of P. acceptable to a new, middle-class type of patron and the P. of artists struggling in the face of opposition and misunderstanding to express their time. It is not to be wondered at that the hist. of 19th-cent. P. is to be studied in a series of new and even militant 'movements.' To begin with there was an attempt to create a new 'classicism.' In France, David (1748-1825) sought to convey the spirit of the Fr. Revolution by reminders of the heroic republicanism of ancient Greece and Rome, executed in a severe style. In Germany, through the teachings of Winckelmann, to emulate Gk art was looked on as the only salvation. Against

this tendency, Romanticism grew in opposition—as an emotional mood rather than a style of P. Among Germans it took the form of a return to the religious spirit of the medieval past; and the so-called 'Nazarenes,' led by Cornelius and Overbeck, from about 1810, tried to estab. a national, romantic school. Romanticism in Eng. P. is represented by the heights, distances, and splendours of Turner's art; in France by the passionate and dramatic canvases of Géricault and Delacroix. Neo-Classicism may be dated c. 1760-c. 1840 and Romanticism from c. 1800 to c. 1850.

English landscape P. undoubtedly played an important part in the 'return to nature.' Constable's 'Haywain' at the Salon of 1824, together with examples of the water-colour school, deeply impressed Fr. painters. The romantic feeling for nature is exemplified by the Barbizon School from c. 1830; but the decadence of Romanticism produced much P. of dubious value. One result was the so-called 'historical' or costume picture, of which every European country provides examples, telling some entertaining story and pleasing the public with representations of past finery but devoid of real merit. Realism, the truth of contemporary life, and also the search for a vital principle in form and colour, were the antidotes.

**REALISM AND IMPRESSIONISM.** In England realism is exemplified by the Pre-Raphaelites, in their early enthusiasm for 'truth to nature,' and the P.s produced under this inspiration, notably in the 1850's; in France by the realism of Courbet (1819-77) and of Manet (1832-83), which was succeeded by the very important movement known as Impressionism (q.v.). Elements of Impressionism already existed in the work of Constable and Turner, in their respective efforts to express light in terms of colour. This was essentially the realistic aim of the Fr. painters, who began to pursue it before 1870 but became known as Impressionists from 1874. They were inspired considerably by the recent scientific researches into colour and to some extent by photography. So the first exhibition (1874) embodied two main principles: (1) Landscape, done out of doors, was treated as a single vision seen in a flash, not as a collection of separate objects seen successively. (2) The use of spectrum colours and of 'complementary' colour to give a more vivid interpretation of light, i.e. the shadows on a stone, instead of being a deeper stone colour, would be green or violet, according as the light which fell upon the stone tended in itself to be red or yellow. Claude Monet's work is one example of this approach. Monet's Impressionism depends on the vividness produced by the direct translation of light into colour when working in the open from nature. His colleague, Pissarro, also practised for a time a severe form of Impressionism under the influence of Seurat's *pointillisme* (1886). This consisted in laying spots of pure colour side by side on the canvas so as to blend when



seen at the right distance. But this proved too mechanical. It was also a defect of the Impressionist method that form was neglected in the pursuit of atmospheric effect. Renoir and Degas both turned their backs on this form of Impressionism. Renoir, who left enchanting works while still under the inspiration of the new-found methods, turned to a solid treatment of form with rich glowing colour recalling the Venetians and Rubens; while Degas, retaining much of the love of light effect, felt himself to be first a draughtsman and urged his colleagues to consider new combinations of drawing rather than colour. These two great painters stand out by reason of their superb draughtsmanship, lovely colour, and sound picture making—Renoir with his lyrical enthusiasm for flowers, sunny landscape, and women, Degas with his passion for figures in movement and his original composition.

The POST-IMPRESSIONISTS (q.v.), innovators in their separate ways, brought back a feeling for rhythm and mass, line and silhouette. Cézanne, in particular, wanted a return to solid and secure picture-making. He realised that there must be a balance between designing in the second dimension and in the third. Shapes must suggest weight and solidity and be welded together in a more architectural treatment. All this had to be done by means of patches of perfectly related colour which denied neither the colour of light nor the local colour of objects. His later work, however, foreshadows the abstract painters of the 20th cent. Van Gogh, too fiery to be content with Seurat's method, evolved a violently linear method of drawing in paint with bright-coloured lines laid on flat, bright areas of colour, with an almost complete absence of shadow effects. Gauguin in the S. Seas found the subjects he needed for his rich decorative treatment of shapes by silhouette and local colour.

FAUVISM (1906) arose from a feeling that previous movements were exhausted, and a desire to use colour more freely to an emotional purpose. Matisse produced a shorthand system of colour and drawing which, emptying out all photographic influence, makes excellent decoration. It looks spontaneous, but is the result of study and knowledge. Of the others (who included Utrillo, Friesz, Dufy, Segonzac), Picasso, Braque, Derain went on to CUBISM (q.v.). The nature of CUBISM and its many phases make it difficult to describe in words. Study of Cézanne's later method led to a splitting up of forms into separate planes, to geometrical essentials. These planes are recombined so that an effective design transpires, but the original recognisable form frequently disappears. The partly recognised form is probably the chief cause of annoyance to those who do not understand Cubism. Periods of analysis and mathematical abstraction followed. Designs in superimposed layers of coloured or patterned papers, small objects fixed to the surface, with drawing and P. linking these effects together, were devices which

illustrate the divorce of P. from its old function of representation. The work of Picasso, Braque, Juan Gris, Francis Picabia, and Fernand Léger illustrates various aspects of the Cubist idea. In Italy Futurism (q.v.) was in technique an offshoot of Cubism and also a protest against classic calm as seen in the dead atmosphere of museums. Violent action was to be painted—an aim more suited to the cinema. Marinetti's poems gave it a flying start, but the movement was short-lived, though in their attempts to show successive motions on the same canvas, or a number of things seen individually at the same time, the works of Gino Severini, Giacomo Balla, and Umberto Boccioni have a curious interest. Expressionism (q.v.) arose independently in Germany about 1906. The emphasis is on feeling rather than form. Kandinsky (a Russian), Franz Marc, and Paul Klee founded a group while influenced by Picasso. Kandinsky's art is a compound of Cubism, Ger. mysticism, and psychoanalysis. Klee, a precursor of the surrealists, had a whimsical invention and feeling for the spontaneous products of the mind and hand. He once described one of his pictures as 'taking a walk with a line'—a fair enough description of many of them. Georg Grosz in his scenes of night life revealed the hysteria prevalent in Germany after the close of the First World War. Dadaism was the final expression of frustration after the war, but left nothing noteworthy.

SURREALISM, which began to gain ground from about 1925 and was influential until shortly before the outbreak of war in 1939, chiefly consists in the relating of forms seldom found together in everyday life, and giving the impression of a dream-world or a nightmare. Its chief value has been not only to explore the 'unconscious,' but to restore something of imaginative vision to P. Dalí remains its most striking exponent, but the movement has established no style of P. Chirico in 1913 was already doing remarkable P.s of classical landscapes, buildings, horses on the seashore. Since then he has repudiated his early work. Henri Rousseau stands apart as a genuine modern primitive. An official in the Paris *octroi*, he painted at week-ends jungle and bourgeois scenes in a naïve style which is poetical and decorative. Not all Fr. painters have taken to entirely new forms of P. Vuillard and Bonnard, for example, remained faithful to the portrayal of quiet domestic life in bourgeois surroundings—Vuillard a lovely colourist with a strong feeling for pattern, Bonnard a late follower of the Impressionists. Rouault, originally a designer of stained glass, is individual in his portrayal of the horror and agony of life in his tragic figures and faces. Yet the final outcome of this amazing series of movements in P. is a tendency to complete abstraction, notable not only in the young painters of the School of Paris but also in active younger circles in England and the U.S.A.

ENGLISH PAINTING FROM 1870. The artistic movements which may arise from

discussion in restaurants and cafés are seldom found in England. Impressionism, however, found a footing at the Grosvenor Gallery Exhibition of 1877, and later in the New Eng. Art Club (1886), which also included John Sargent, the Amer. portrait painter, W. R. Sickert, a link with the Impressionism of Whistler and Degas, who painted with gusto racy or drab subjects, and Augustus John, a great Romantic artist and brilliant draughtsman, famous for portraits and compositions of gipsy life. Wiston Steer, O.M., whose Impressionism derived originally from France, returned to the Eng. tradition of Constable. The first Post-Impressionist exhibition in England was

ment; his influence has revived today and sev. young painters show it. He was the founder of the 'Vorticists,' who had as their mouthpiece a pub. entitled *Blast*. His style was intensely virile and his drawing highly idiosyncratic. Later formations were the Camden Town Group (1911) and the London Group (see above).

The period between the world wars produced many promising painters. Edward Bawden and Eric Ravilious both continued a fine tradition of Eng. water-colour drawing with gaiety and humour. Many young painters found effective scope for their topographical P. as war artists or in recording Britain. The war artists were better as recorders of the way things



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PAUL NASH : THE MENIN ROAD, 1918

held in 1910, created an uproar, and gave a great impetus to many Brit. painters. Duncan Grant is an example with his robust treatment of solid forms in resonant colour. The war artists of 1914-18 also did striking work in the new idiom. C. R. W. Nevinson relied on a sharp geometrical style and for a while a reduction of forms to the near-abstract. Edward Wadsworth did something similar in his own style. Wm Roberts interprets natural shapes rather in terms of machinery, his pictures being meticulously organised. Henry Lamb, Eric Kennington, Stanley Spencer, with his highly personal vision continuing a vein of Pre-Raphaelitism, and the brothers Paul and John Nash are all associated with this period. Paul's formal structural P.s show Cubist influence. He was the moving spirit in 'unfit one,' a group 'devoted to design as a structural pursuit,' while John's water-colour landscapes are notable for economy of means and cool planning. Wyndham Lewis was one of the few Eng. artists to be directly affected by the Cubist move-

ment; his influence has revived today and sev. young painters show it. But a few were able to convey something deeper, notably Graham Sutherland and John Piper, who did bring out the horror and the devastation of war. For this they were well equipped by a style that goes far towards the abstract. But Eng. traditional water-colour painters such as Samuel Palmer have also helped to form their style. The drawings of Henry Moore, the sculptor, go farther still and remain the deepest expression of what humanity went through. Other painters who should be mentioned are Matthew Smith, an early follower of Matisse, whose directness of handling goes with a Fauve warmth of colour, and Mark Gentler, a Jewish artist, whose still lifes and portraits are excellently composed and beautifully painted. Of recent tendencies the most vigorous connect with Wyndham Lewis or Piper and Sutherland and the Brit. Romantic painters. On the other hand, the Euston Road Group, formed by Victor Pasmore, Claude Rogers, and others as a protest against

intellectualism, with the aim of 'painting things as they are,' has left a sturdy vein of realism.

**THE PRESENT SITUATION.** The state of the artist is more precarious than ever before, on account of the violent changes in the social system. Patronage in the old style is dead, and the only prospect for the artist is to become a week-end painter. The crisis is now and the outlook gloomy, in spite of the excellent intentions of such bodies as the Arts Council. In Russia the painter is paid by the State, which claims his work when finished. His livelihood is thus assured, but he has to submit to a rigid direction from the State in relation to subject matter and style. Soviet P. shows the influences of European P., but at a level of undistinguished naturalism. In France, as indeed in Europe, it is still Picasso, Matisse, and Braque who dominate the scene.

Taking a wide survey of P. in the last hundred years, and of ideas of P. in the world as a whole, one sees that the result of a less conservative attitude in Europe has been the realisation of merit in the art of non-European countries. The effect of the 'discovery' of the Jap. colour-print on the 19th-cent. P. is well-known. The appreciation of the exquisite qualities of Chinese landscape P. is also of comparatively recent date. P. in the Orient, however, as in Europe, has shown a tendency to abandon tradition in favour of the methods of the School of Paris.

That P. is vigorously pursued in the U.S.A. and the Brit. Dominions there can be no doubt; nor should one exclude Mexico, where a striking national school has come into being. Here again one notices that modern means of communication and the wide distribution of books containing reproductions of pictures have not made for an entirely local or regional art. The U.S.A. has always had its links with Europe in P., first with England in the colonial period, then with the schools of Munich and Paris; and if in recent times a Thomas Benton (b. 1889) or a Reginald Marsh (b. 1898) give the actuality of the Amer. scene, many more are fascinated by the abstract art that comes from Paris. Canada has had a notable modern school of landscape, while Australia vigorously faces the task of interpreting a continent—the paintings of Sidney Nolan, e.g., showing appreciation not only of a primeval landscape, but of the rough early hist. when the bush-ranger was to be found. In Mexico the P. of Rivera, Orozco, and Siqueiros shows its own effort to reconcile tradition and modernity. *See also* DUTCH ART; ENGLISH ART, *Painting*; FLEMISH ART; FRENCH ART; GERMAN ART; IMPRESSIONISM; ITALIAN ART; LANDSCAPE; PORTRAITURE; POST-IMPRESSIONISM; SEASCAPE; SPANISH ART; STILL LIFE; and articles on art under countries.

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**Painting and Decorating.** Painting is the covering of a surface with paint in order to prevent its deterioration by exposure to the air. Decorating is artistic, as well as utilitarian, in its aim. The term covers paper-hanging, decorative painting, and the use of decorative paints and coloured washes on ceilings and walls. Both painting and decorating are frequently done by the amateur as well as the professional.

**Exterior Painting.** Various types of brushes are used, differing according to the article painted. For painting door panels, gates, etc. brushes at least 2 in. wide are normally used, and brushes 1½ and 1 in. respectively for painting window-sashes and smaller surfaces. The latter are sometimes called sash tools. Only brushes of high quality produce a perfect finish. After use it is necessary to clean the brushes thoroughly in turpentine and soapy water. The surface to which the paint is applied, whether it is iron or wood, should be clean and dry. Dirt and moisture cause harmful chemical action, and moisture can produce blisters on the paint film. If in bad condition the old paint must be stripped with a blowlamp and scraper, holes and splits filled in with putty or one of the many special fillings such as Alabastine, and the surface (if wood) sandpapered. If the old paint is not much blistered the surface should be cleaned down with a solution of sugar soap and water, followed by a wash with clean water, and sandpapering follows, if necessary. Before painting ironwork all rust and scale are removed with a wire brush. Three coats of paint are generally used, priming, under coat, and top coat. The priming covers flaws and irregularities in the original surface, and provides a secure foundation for the subsequent coats. A red-lead paint is used as a primer on wood and iron. Special primers are used for plaster surfaces. The under coat provides both good adhesion to the primer and a foundation for the top coat. As paint films change considerably in volume during drying and weathering, and also contract and expand with changes in temperature and atmosphere, it is

necessary to choose paints which do not differ greatly in constitution from the paint of the following coat. An ordinary oil paint can be used as a top coat with a coat of good outside varnish as a protection, or with a varnish paint, known as 'hard gloss.'

**Interior Painting.** It is not generally necessary to burn off the old paint. Grease marks may be removed with a weak solution of sugar soap, which is then washed off with clean warm water, and the surface rubbed down with a soft cloth. A very fine glasspaper gives a smooth surface. If the new paint is a similar shade to the old only one coat of paint should be necessary; but if the old paintwork is of a dark colour and a cream or light finish is required an under coat must be applied.

**Distemping Ceilings.** Brands of distemper or whitewash are obtainable in powder or paste form which require only the addition of water. The decorator should be equipped with 2 buckets of water, a distemper brush, and a sponge before commencing to wash off the old whitewash. The brush is then filled with water and applied to the ceiling. Approximately 1 square yard at a time is well soaked, and the water then sponged off, the second bucket of water being used to clean the brush and sponge. When all the whitewash has been removed the cracks in the ceiling and frieze are cleaned out with a pointed knife and stopped up with plaster of Paris or similar filling. A coat of size is applied to prevent the plaster from absorbing the distemper, and the distemper or whitewash follows. In order to avoid brush marks the work is done as rapidly as possible so that the edges of one section do not dry before the next is commenced. It is usually best to begin the work at a point in the room farthest away from the light. For walls an oil-bound distemper is used. Distempers are available in a wide range of colours.

**Paper-hanging.** Various types of designed paper can be used. In choosing the paper the size and use of the room in question should be considered. Repetitive patterns in a bedroom are not generally thought restful, and for small rooms neat, unobtrusive patterns are usually preferred, since the size and brightness of a pattern can make the room seem smaller. The overall patterns, or patternless papers, are now the most popular. It is advisable to strip off the old wallpaper entirely before fixing the new; to do this the old paper should twice be thoroughly soaked in water, and the paper then pulled away with a stripper. Cracks and holes in the walls are then filled in with plaster of Paris, Alabastine, or Keene's cement. Perfectly straight edges to the paper are essential if it is to be butt-jointed. This produces a better finish than the lap-jointed paper. Paste can be purchased which only needs mixing with cold water to be ready for use, but a flour-and-starch paste is also good. It is wise to use a lining paper on a bad surface, the wallpaper being pasted over it. If the paper

is to be hung edge to edge (butt-joint) the first piece of paper may be hung in any corner of the room; if lap-jointed the papering should be started at the farthest corner away from the door. The paper is placed on a boarded trestle table, 21 in. wide, for pasting. When this is done the paper is pasted to the wall by attaching the top right-hand corner against the picture-rail, raising or lowering the left hand to bring the paper plumb, and pressing the paper on the wall with a paper-hanger's brush, working from the top downwards. For attaching to ceilings the paper is folded over a roll which is lifted with one hand while the end is attached with the other. Embossed materials such as Lincrusta are stiffer than paper, and can, if desired, be oil-painted.

**Mass-production Methods in Painting.** Painting by a brush is in many cases too slow a process to be economical, and often does not give very satisfactory results. Flowing is used on large flat surfaces such as the sides of trucks. The top is painted so that the paint flows over the surface, draining into a trough from which it can be pumped up for use again. Dipping is satisfactory where the paint is fulfilling an essentially protective function, since it enables the paint to penetrate parts which the brush could not touch. It can be applied only to articles where the paint can run off uniformly. The articles are put on a travelling belt which takes them through a paint bath into a drying chamber. Spraying, where the paint is sprayed through a nozzle, is chiefly used in the case of cellulose lacquer, e.g. in painting motor cars.

**Some Decorative Methods.** Staining and graining are common methods of decoration in paintwork. Staining is the imitation in paint of hardwood, such as mahogany; graining is the imitation of natural wood. Plastic and cellulose paints and enamels are also used in decorative work. Satisfactory results require a high degree of skill.

See E. W. Hobbs, *Painting, Enamelling, Paper-hanging, and Distemping*, 1937; D. Miller, *Interior Decorating*, 1937; J. P. Parry, *Painting and Decorating*, 1938; J. Mason, *Painting and Decorating*, 1948; W. P. Matthew, *Home Decorating*, 1948; and A. E. Hurst, *Painting and Decorating*, 1949.

Paints consist of finely powdered, insoluble materials, principally pigments (q.v.) suspended in liquid binding media, and possess the property of drying to adherent films on exposure to the atmosphere or the application of heat. They are used for the decoration and protection of all types of articles and buildings, and for artistic purposes. The principal function of pigments is to impart colour and opacity, although there is a further group of materials, known as extenders, which are often loosely classified as pigments. The most common extenders are ground barytes, blanc fixe (precipitated barium sulphate), asbestos (fibrous talc), china clay, and whiting (calcium carbonate); and whilst they impart little or no colour or opacity, they are widely used to lower raw

material cost. Providing this is not carried to excess, no harm results; indeed, in certain circumstances the presence of extenders may strengthen the film of paint and even improve its durability.

**Binding Media** consist of drying or semi-drying oils and/or resins and are thinned, if necessary, with suitable solvents such as turpentine, white spirit (turpentine substitute), the coal-tar hydrocarbons (benzol, toluol, xylol, and naphtha), or, in the case of special paints, with certain alcohols, esters, ketones, and chlorinated hydrocarbons. Linseed oil is still the principal drying oil used in paints, although large quantities of tung oil (chinese wood oil) and dehydroxylated castor oil are also used. Tung oil dries more rapidly than linseed oil and is more water- and chemical-resistant, whilst dehydroxylated castor oil has a degree of chemical and water resistance approximately half-way between the two: it also yellows much less on exposure, but tends to dry with a film which remains tacky for a long time. A number of other oils such as perilla, soya bean, oilcloa, stillingia, sunflower seed, hempseed, tobacco seed, and various fish oils are also used to some extent. It is nearly always necessary to process such drying oils by refining or by heat treatment in order to improve their performance. Heat treatment increases the viscosity of the oil, usually by partial oxidation and by polymerisation (a chemical process in which molecules of the same compound associate to form more complex molecules). Such treatment can profoundly affect flow, gloss, durability, chemical resistance, and drying time whilst removing such undesirable properties as 'ropiness' (the showing of brushmarks), wrinkling, and after-tack. It also permits a greater addition of solvent, thus lowering the price of the finished P.s.

**Resins** used in P.s. can be classified as either natural resins or synthetic resins, although the former have to a very large extent been replaced by the latter. The commonest natural resin is rosin (colophony) (q.v.), which is the residue remaining after the distillation of turpentine from the exudation of the pine-tree; wood rosin is obtained by solvent extraction from old stumps of pine-trees. Whilst rosin can be used on its own in oils to form P. media, this is done only in the manufacture of the cheapest P.s. Its performance can, however, be much improved by reaction with lime, zinc, or glycerine, by hydrogenation and polymerisation, and by reaction with synthetic resins. The other main class of natural resins are the copals. These are derived from fossil or more recent forest remains, and usually bear the name of the district of origin, e.g. Congo copal or Sierra Leone copal. Nowadays these are mainly used in varnishes (q.v.). The earliest synthetic resin used in P. was made by reacting phenol with formaldehyde and combining the resultant resin with rosin in order to obtain solubility in oil. It was subsequently found that, by using more complex phenols, the rosin could be dispensed with, this resulting in resins having greater durability

and water and chemical resistance. These

lined with drying oils to form media having good durability, gloss, and resistance to water and chemicals. The most important class of synthetic resins is the alkyds. These are made by reacting glycerine or pentaerythritol with phthalic anhydride and drying oils. Other modifications can also be made, such as the introduction of phenol or rosin. The alkyd resins give P.s. of the highest durability, of excellent gloss retention, and good drying properties. They are also used in the manufacture of industrial finishes either on their own or, for stoving finishes, in admixture with urea resins (urea reacted with formaldehyde), or with melamine resins (melamine reacted with formaldehyde). See RESIN.

**Driers** must be added to P.s. containing drying oils in order to accelerate the drying process. These are catalysts which increase the rate of oxidation or polymerisation of the oils. The driers used are usually the organic salts, such as the resinates, linoleates, naphthenates, or octoates of lead, cobalt, and manganese, although other metals, such as iron, vanadium, and cerium, can be used.

**Water P.s.** basically follow the above pattern, except that water is used in place of organic solvents, and additions of water-soluble or water-dispersible substances may be made. Distempers contain white pigment, usually lithopone, and whitening and may be bound with glue (non-washable distemper) or casein (fast-bound distemper). Oil-bound distempers contain glue and/or casein into which oil and/or resin is emulsified. Plastic emulsion P.s. are water paints based on emulsions of synthetic resins such as polyvinyl acetate or poly-styrene, and are characterised by excellent washability and resistance to lime.

**Manufacture of P.s.** is carried out mainly in two types of machine. The ball mill consists of a horizontal cylinder lined with steel or porcelain and containing a charge of steel balls or pebbles. The paint and the balls are turned round for a number of hours until the pigment is properly dispersed. Other mills are based on rollers which crush the mixture of oil and pigment between them, whilst refining is carried out by means of a single roll mill which causes the paint to pass between the roller and a fixed iron bar.

See Oil and Colour Chemists' Association, *An Introduction to Paint Technology*, 1949; S. R. W. Martin, *Synthetic Resin Chemistry for Students*, 1951; H. W. Chatfield, *Glossary of Terms Used in the Paint, Varnish, and Allied Trades*, 1951; L. A. Jordan et alii, *Oils for the Paint Industry*, 1951; M. R. Mills, *An Introduction to Drying Oil Technology*, 1952; Noel Heaton, *Outlines of Paint Technology*, 1956. See also LUMINOUS PAINT.

Paisiello, Giovanni (1740-1816), It. composer, b. Taranto, learnt his art from Durante, Cotumacci, and Abos. After his first successes with two comic operas fortune smiled on him in spite of the

formidable rivalry of Piccini and Cimarosa, a rivalry which aroused endless jealousies in P. For 8 years (1776-84) he enjoyed the lavish patronage of the Empress Catherine at St Petersburg, and after serving Ferdinand IV at Naples until 1799 he was engaged by Napoleon in Paris as musical director in his chapel. His *Barbiere di Siviglia* was very successful until it was displaced by Rossini's brilliant opera of the same name.

**Paisley** (in Rom. times *Vanduaara*), burgh on both sides of the White Cart R., 3 m. above its confluence with the Clyde, and 7 m. WSW. of Glasgow, in Renfrewshire, Scotland. A 15th-cent. decorated nave is almost all that is left of the old abbey church, which was founded in 1163 by Walter Fitzalan as a Cluniac monastery. In 1307 the English razed the abbey to the ground, and it had not long been rebuilt when it again suffered during the Reformation. It has now been carefully restored. There are a 16th-cent. grammar school and a technical college, and also in the town are statues to Robert Tannahill, the native poet; Robert Burns (q.v.); Alexander Wilson, the Amer. ornithologist; Sir Peter Coats (d. 1890), who presented the free library and museum; Thomas Coats (d. 1883), who gave the observatory and Fountain Gardens; and George Aitken Clark (d. 1873), the thread manufacturer, who helped to build the town hall. In the early 18th cent. the town was already noted for its manuf. of shawls (since gone out of fashion), silk-gauze, muslin, and linen; but the staple industry of to-day is the making of linen thread. Other industries include dyeing, bleaching, distilling, engineering, ship-building, and the manuf. of chemicals, carpets, etc. There is a good harbour. St James's Park (40 ac.) and Barshaw Park are the two largest open spaces. P. sends one member to Parliament. Pop. 93,700.

**Paisley Terrier**, see **CLYDESDALE**.

**Paisy** (1722- after 1784), monk of Khlendar, Mt Athos. Irritated at the contempt of Gk, Russian, and Serbian monks for Bulgarians, he compiled the *Slaveno-Bulgarian Hist.*, 1782, to show Bulgarians that they had cause for pride, not shame, in their past. The first work in anything like modern Bulgarian, it was circulated in MS. (printed only in 1844), and was the signal for the revival of Bulgarian national consciousness, a revival that culminated in the liberation of Bulgaria.

**Paita**, port and cap. of the prov. of P., in N. Peru, in the dept of Piura at the mouth of the Chira R. It is the outlet for the chief cotton dists. The town has an old-world Sp. appearance and the buildings are mostly of wood. Its anct church has a miraculous statue of the Blessed Virgin. It exports, besides cotton, hides and skins, and Panama hats from Catacaos. Pop. 7200.

**Päivrinta, Pietari** (1827-1913), Finnish novelist, b. Ylivieska, was the son of a peasant, and made his name as a writer with stories of peasant life. He was one of the first to write fiction in Finnish, his

pubs. including *Tintti Jaakko*, 1883; *Syyslehtiä*, 1900; and *Pikku Iuvia elämästä*, 1904.

**Pajou, Augustin** (1730-1809), Fr. sculptor, b. Paris, won the Prix de Rome in 1748, and thus was sent at public expense to Rome to study art. On exhibiting his 'Pluto holding Cerberus in Chains' he was elected to the Academy. He carved excellent portrait busts of Mme du Barry, Bossuet, Buffon, Turenne, Pascal, and Descartes, and executed also the sculptures of the Salle de l'Opéra at Versailles. His 'Psyche Forsaken' was acquired by the Luxembourg.

**Pakhoi**, seaport, 12 m. SW. of Lien-Chou in W. Kwangtung prov., China. The native and foreign quarters are distinct, the latter being on a hill. Since 1876, when it was opened for international trade, the volume of its exports (indigo, aniseed, cuttle-fish, sugar, and cassia-oil) has grown enormously. Manganese ore is mined near by. Pop. 36,000.

**Pakhsto**, see **PUSHRU**.

**Pakistan**, a republic, member of the Commonwealth, formerly part of Brit. India, divided geographically into two parts more than 1000 m. apart, the W. portion consisting of the former Baluchistan, Sind, Punjab (part), and NW. Frontier areas, together with the adjacent states (except Kashmir, q.v.), the E. portion of Bengal (part) and Assam (part). For history prior to 1947 and general information, see **INDIAN SUBCONTINENT**.

**Area and Population.** The area of P. is 364,737 sq. m. and the pop. (1951) 75,842,165. Of the total, 86 per cent are Muslims. The prin. cities are Karachi (1,000,000), Lahore (850,000), Dacca (411,000), Chittagong (294,000), Hyderabad (202,000), Rawalpindi (237,000). P. is the largest Muslim state in the world.

**Physical Features.** The W. portion of P., lying to the NW. of India, contains much desert and barren rocky tracts. At the same time, it contains the great valley of the Indus, and the fertile and well-watered plain of the W. Punjab. In addition, in the former Sind Prov., there is the vast area served by the great irrigation systems stemming from the Sukkur Barrage on the Indus. The climate is one of extremes of temp., with a somewhat erratic and exiguous rainfall. The E. portion, lying E. and N. of Calcutta in India, is tropical, heavily watered, lying along and largely below the valley of the Brahmaputra, widely intersected by waterways and liable to flooding from a consistently heavy rainfall. The climate is warm and humid.

**Agriculture.** Agriculture is the main occupation of the people, nearly 80 per cent of the pop. being so engaged. The main food crops are rice and wheat, together covering 34,000,000 ac.; the main commercial crops are cotton, rape and mustard, and jute, together covering 6,250,000 ac. As has happened in nearly every country embarking upon intensive industrial development, there is a tendency to produce more cash crop and fewer food crops. The P. Gov. are therefore devoting much attention to schemes for

increased irrigation, use of fertilisers, improved seeds, and greater production per ac. Irrigation schemes aim at bringing more than 6,000,000 ac. under new cultivation.

**Industry and Power.** P. came into existence with little estab. industry. Planning has therefore started largely from scratch and covers a very wide field. There are a number of power projects at or nearing completion, of which the most important are Karnaphuli hydro-electric in E. P. (160,000 kW.), Warsak hydro-electric in W. P. (150,000 kW.), the Sui natural gas in W. P. (127,000 kW.). The jute industry in E. P. has received special attention. The fixation of the boundary

medicines. The estimated balance of exports over imports for 1955-6 is about 750,000,000 rupees (£57m.).

**Education.** Figures from the 1951 census show the percentage of literates in P. as 18.9. The Gov. have undertaken a vigorous drive to eradicate illiteracy. There are now 52,000 primary and secondary schools, some 180 colleges, 7 medical colleges, and 6 univs., Dacca, Karachi, Peshawar, Punjab, Sind, and Rajshahi, accommodating some 80,000 students. The univs. are assisted by Gov. grants.

**Communications.** P. has of necessity 2 railway systems, the NW. Railway in W. P., with a mileage of 5344 m., and the E. Bengal Railway, with a mileage of 1703



E.N.A.

PESHAWAR: A STREET IN THE BAZAAR QUARTER

between P. and India had the curious effect of leaving the main jute supplies in P., but the mills in India. P. has now erected 13 jute mills in her own ter. Among other industries receiving particular encouragement are paper, chemicals and fertilisers, cement, iron and steel, sugar, and textiles. Crude petroleum production has been increased between 5 and 6 times since 1947, and exploration for further resources is in progress. Industrial expansion generally is the subject of a comprehensive five year plan begun on 1 April 1955.

**Trade.** Since 1950 P. has had a consistently favourable trade balance. At first the prin. commodities exported were jute, cotton, wool, hides and skins, and tea. The emphasis is, however, changing from primary commodities to processed goods, in particular manufactured jute goods, cotton yarn, and cloth. Imports of cotton piece-goods, twist, and yarn have largely disappeared, and the prin. imports now appear to be mineral oil, machinery, metals and ores, and drugs and

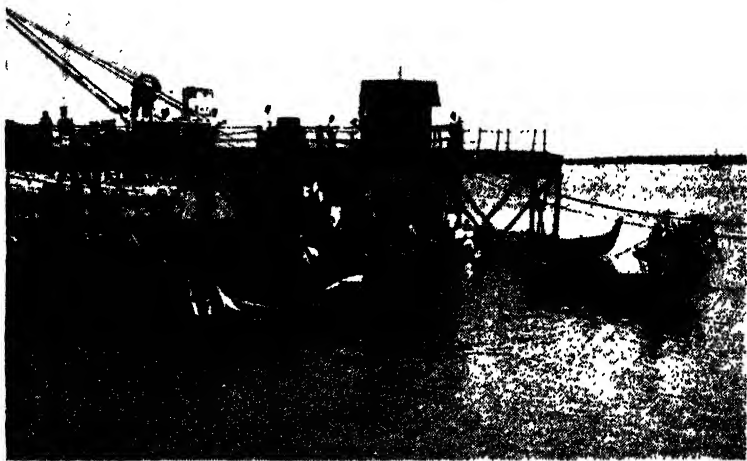
m. More attention is being given at the present time to improvement of stock and track than to expansion; owing to the shortage of coal, large purchases have been made of diesel-electric locomotives. In E. P. inland waterways are of major importance. There are 2670 m. of navigable waterways, with over 1000 self-propelled craft in operation. Civil aviation, which provides the only speedy communication between W. and E. P., is rapidly developing under the Gov.-sponsored P. International Airlines Corporation, Karachi, Dacca, and Chittagong all being recognised international airports.

**Defence.** The P. Defence Services, which consisted originally of those sections of the former Indian Army allotted to P. on partition, began their independent existence with not a few handicaps, but with the highest traditions and a gallant record. An officer training school was opened at Kohat in 1948, and the P. Military Academy at Kakul in 1948. The old Staff College at Quetta was taken over, and continues to be a model of its

kind. One of the greatest handicaps was the lack of any ordnance factory, all the existing ones being located in Indian ter. A new ordnance factory centre and town is now being developed at Wah. For the Navy, 2 big projects have been a naval base at Chittagong and a naval dockyard at Karachi. The P. Air Force College at Risalpur is expanding and, though many officers still go abroad for advanced training, home facilities are on the increase.

**Currency and Finance.** The monetary unit is the rupee of 16 annas. Until July 1955 the sterling equivalent of 1 rupee was 2s. 2d.; it was then devalued to 1s. 6d., on a parity with the Indian rupee. The

Dominion under the provisions of the Indian Independence Act, 1947. In 1949 the Constituent Assembly began its consideration of the future constitution. The deliberations proved long and difficult. In 1955 sufficient agreement had been reached for the Governor-General to appoint a new Constituent Assembly, and the new constitution came into force on 23 Mar. 1956. P. is now a Federal Democratic Islamic Republic, continuing her membership of the Commonwealth of Nations, and recognising the Crown as the symbol of the free association of the independent members and as Head of the Commonwealth. The federation is of the



*The High Commissioner for Pakistan*

THE JETTY AT THE SADAR GHAT, CHITTAGONG, EASTERN PAKISTAN

change indicated the development of P. from a self-contained and almost wholly agric. country into an increasingly industrialised and exporting one, imposing the necessity to adjust her finances more closely to international trends in finance. Revenue receipts have increased from 667.6m. rupees (£50m.) in 1948-9 to 1276.8m. rupees (£96m.) in 1955-6 (estimated). Revenue expenditure has similarly increased from 647m. rupees to 1276.2m. rupees (£96m.). Apart from the large increase in both totals, the most significant feature in the receipt figures is the fact that, while customs receipts continue to constitute the largest single item, the increase has been greatest in income tax, sales tax, and central excise, a clear indication of the rapid internal development; on the expenditure side, the greatest individual increases are to be found in the beneficial and social services, both being 4-5 times greater. Civil works have increased 3 times. The sterling balances at Dec. 1955 stood at \$64.1m.

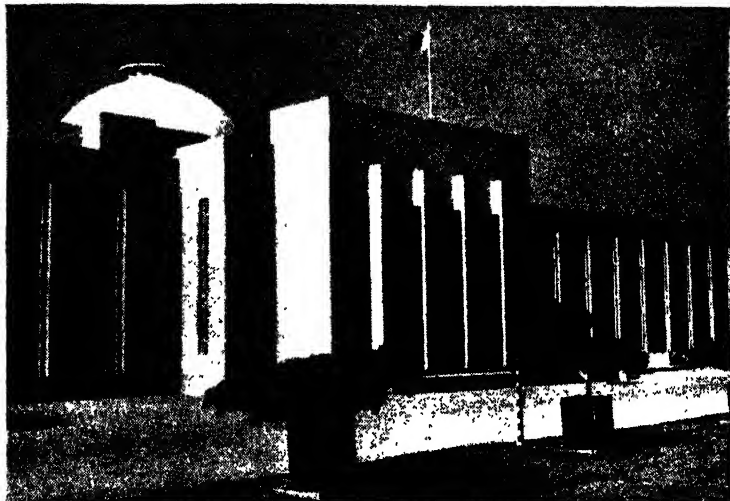
**Constitution.** In 1947 P. became a

2 units, E. P. and W. P., and all previous divisions into provs. and states have been abolished. It is provided that the President must be a Muslim, and a unicameral legislature is estab. of 300 members, the National Assembly, the members being directly elected on a basis of parity between E. and W. P. Each of the 2 units has its own Assembly and Cabinet. The judiciary is independent, and provision is made prohibiting discrimination of any kind against minority and non-Muslim communities. A provision of particular interest is that no law shall be enacted which is repugnant to the injunctions of Islam as laid down in the Holy Quran and *Sunnah*, and that a Commission shall be appointed to recommend the manner and stages by which this provision shall be given effect, and to compile a list of those Islamic injunctions to which legislative effect can be given. The constitution also provides that these provisions shall not affect the personal laws of the non-Muslim citizens or their status as citizens or any provision of the constitution.



*History from August 1947.* It would be difficult to conceive more disadvantageous circumstances than those in which P. began her independent existence. Although agreement was reached between India and P. by Dec. 1947 on the division of the financial assets and liabilities of the former Gov. of India, and of the armed forces, there were a host of intractable problems. The frontier demarcation, combined with the complete lack of confidence between the 2 new Govs., and between Muslims and Hindus, set in motion wholesale communal massacres, followed by an unparalleled exodus of

waters. On top of all this, it should be recalled that the percentage of Muslims in the main administrative services of the former India, including the Indian Civil Service, had always been low, that communications between the 2 parts of P. virtually did not exist, and that internal differences and rivalries between the provs., such as Sind, the Punjab, and Bengal, soon proved that they were at least as powerful as the uniting emotion of a free Islamic state. In addition, P. had to stand the death of her founder and first Governor-General, Mahomed Ali Jinnah (q.v.), in Sept. 1948, and the



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refugees in both directions. The worst effects were felt in the Punjab, but Calcutta also was a scene of tragedy, as also many towns in the N. of India, including Delhi itself. It stands to the lasting credit of Mahatma Gandhi, Jawaharlal Nehru, and Liaquat Ali Khan that they allowed no considerations of personal danger or political esteem to interfere with their joint and determined efforts to end this senseless holocaust. Within 3 months law and order had mainly been restored, but unfortunately not the confidence between the 2 Govs., or indeed between the peoples of the 2 countries. P. thus started on the worst possible terms with her immediate neighbour, with whom her whole political, administrative, and economic life had till then been integrated. Feelings were, of course, exacerbated by the events in Kashmir (q.v.), a problem which unhappily subsists, and by a lack of definition in the terms regarding the use of the waters of the great rivs. which irrigate the Punjab and of the canal

assassination by a fanatic of her first Prime Minister, and Mr Jinnah's closest confidant, Liaquat Ali Khan (q.v.), in Oct. 1951.

Against such a background it is not surprising that the hist. of P. since 1947 is mainly of internal affairs, and among them largely matters of political adjustments. It is indicative of the difficulty and delicacy of those adjustments that it took from 1949 to 1956 to reach agreement on the terms of the constitution (see above). It is worth mentioning that the difficulties were not wholly due to political considerations and that a very real problem, not yet wholly solved, arose from the determination to found both the constitution and the body of P. law upon the principles and injunctions of Islam, the latter in particular being open to divergent interpretations. The political rivalries and dissensions are much too intricate to detail in this article, but it must be mentioned that in 1956 the Muslim League, the Gov. party welded and held

together by Mr Jinnah and Mr Liaquat Ali Khan, suffered a total eclipse in E. P., and went into opposition in the Central Assembly. Mr. H. S. Suhrawardy, leader of the Awami league, became prime minister in succession to Mr Mohammed Ali in Sept. 1956, leading a coalition of his own and other parties; after his resignation he was succeeded by Mr. I. I. Chundrigar in Oct. 1957. On Mr Chundrigar's resignation, Mr M. Firoz Khan Noon became premier in Dec. 1957.

See I. A. Shah, *Pakistan: a Plan for India*, 1944; Pakistan Institute of International Relations, *Introduction to Pakistan*, 1948; T. G. Spear, *India, Pakistan, and the West*, 1948; R. Symonds, *The Making of Pakistan*, 1950; I. H. Qureshi, *Pakistan and Islamic Democracy*, 1950; Sir R. E. M. Wheeler, *Five Thousand Years of Pakistan*, 1950; Lord Birdwood, *A Continent Decides*, 1953; O. H. K. Spate, *India and Pakistan*, 1954; Gov. of Pakistan, *Constitution of the Islamic Republic of Pakistan*, 1956.

**Pakkhto**, see **PUSHTU**.

**Pakkoku**, dist., with an area of 6210 sq. m., in Upper Burma. Arid regions are interspersed between the fertile valleys of the Yaw, Myittha, and Mön-Sesamun. Oil is found at Yenangyat. Millet and sugar, and also maize, vegetables, rice, and tobacco, are cultivated. The tn of P. (30,000 inhab.), situated on the Irrawadi, is a lumbering centre. Pop. 560,000.

**Palace** (Lat. *palatium*, from Mons Palatinus), word adopted in varying forms (*palais*, *palast*, *palazzo*, *palanquium*, O.E. *palent*) by all European languages. Properly applied to imperial and royal residences, as to those of an emperor, king, or pope, it is also used by extension for any sumptuous habitation. Any episcopal residence receives this name in England, as Fulham, Lambeth, and Cuddesdon palaces. Windsor Castle is the finest example of an Eng. P. in the original sense. The derived meaning of a spacious and attractive building is familiar in the modern 'picture P.' and other places of entertainment.

**Palace Court** (*Curia Palatii*), court erected by the highly unconstitutional Charles I in 1631 to try personal actions arising within 12 m. of Whitehall Palace, whether either of the litigants was of the royal household or not. The judges were the steward of the king's household and the knight-marshal; but later it was presided over by a barrister-deputy, and held weekly in Scotland Yard. Together with the other exceptional and prerogative courts, the Court of Marshalsea and the Court for the Honour of Peveril, it was abolished in 1849, the pending causes being transferred to the common pleas (q.v.) or the co. courts, and the records handed over to the custody of the master of the rolls.

**Palace Theatre**, in Cambridge Circus, London, opened 31 Jan. 1891 as the Royal English Opera House under the management of Richard d'Oyly Carte, with Sullivan's *Ivanhoe*, which ran for 155 performances. The theatre failed and was saved by Charles Morton, who

made it into a world-famous theatre of varieties. It became a revue theatre in 1913. The P. T. has since been noted for musical comedy. It was damaged by bombs in the Second World War.

**Paladin**, name given to the 12 peers of Charlemagne, such as Roland, and also to knights-errant generally. The exploits of the P.s form the theme of the French national epic known as *Chansons de Geste*, the matter of which tended to centralise about one person, Charlemagne, the champion of Christianity and chivalry against the hated Saracen. The word P. is derived from Lat. *palatinus*, and literally denotes a courtier, member of a royal household, or a person connected with a palace (q.v.).

**Palaeobotany**, the science of fossil plants. Knowledge of the flora of the geological past is gained by examination of fossils (q.v.), i.e. plants or their parts which were embedded and remained undisturbed in mud, sand, or ooze while the sediments hardened into rocks. Other fossil specimens were petrified by the infiltration of water containing mineral substances such as silica in solution. In many cases, although the plants have decayed, they have left clear and detailed impressions in fine-grained sediments. Casts of hollow stems and bulky seeds yield considerable information with regard to the morphology of the plant. Some plant remains are found in amber and other fossilised secretions. The organic substance of plants (mainly cellulose and lignin) in time becomes converted into coal, the carbohydrates changing into hydrocarbons. However, the cuticles and spore-coats may remain virtually unchanged, and it is possible to extract cuticles from very ancient rocks.

The earliest plant fossils are those of Pre-Cambrian simple algae, resembling modern blue-green algae (Cyanophyceae), and possibly of iron bacteria. In the Palaeozoic era, from the beginning of the Cambrian to the end of the Silurian periods, the only plant fossils are those of marine algae of the blue-green, green (Chlorophyceae), and red (Rhodophyceae) groups. In the Lower Devonian strata are found the earliest land plants, the Psilophytales, but these show such marked differences from fossils of earlier aquatic plants that it seems probable that there were intermediate forms hitherto undiscovered, perhaps because conditions may not have favoured preservation. The plants of the Upper Devonian were much better developed, and included seed-bearing trees from 30 to 40 ft high. In these strata many of the plants subsequently so prolific in the Carboniferous period made their first appearance. The ancestors of modern Horsetails and Lycopods were well-developed trees during this period; ferns were abundant, and also fern-like seed-bearing plants, the Pteridosperms. The abundance of vegetation at this time may be judged from the coal formed by slow decomposition of these plants under the enormous pressure of subsequent strata. In the early and middle periods of the Mesozoic era, the

cycad-like Bennettitales and conifers became predominant, and towards its close primitive flowering plants appeared. These became increasingly abundant from the Tertiary to the Quaternary periods of the Cainozoic era, and included many forms similar to those of living flowering plants. P. is essential to the study of the relationships and the evolutionary development of plants (see GEOLOGY). The study of spores and pollen-grains, palynology (q.v.), not only reveals the composition of anct forests, but is economically important at the present time. See D. H. Scott, *Studies in Fossil Botany*, 1920, and *Extinct Plants and Problems of Evolution*, 1924; F. H. Knowlton, *Plants of the Past*, 1927; R. Crookall, *Coal Measure Plants*, 1929; A. C. Seward, *Plant Life through the Ages*, 1931; J. Walton, *Introduction to the Study of Fossil Plants*, 1940; and L. Emborger, *Les Plantes Fossiles*, 1944.

Palaeo-ecology, an aspect of Palaeontology (q.v.) concerned with the ecology of fossil organisms.

Palaeogeography, study of climatic conditions and of the distribution of land and sea in the geological past. See GEOLOGY PALAEOGEOGRAPHY.

Palaeography (Gk *palaio*, anct; *graphein*, to write) is the branch of knowledge which seeks to decipher (that is, to read and interpret), to date, and place any kind of anct writings. In the widest sense of the word it deals with all anct written documents or engraved monuments, in any language, on any writing material, from any period. There are, however, certain branches of study which treat of particular kinds of written documents, such as numismatics (q.v.), which deals with inscriptions on coins; sphragistics, which treats of writings on seals; and epigraphy, which deals mainly with anct inscriptions cut, engraved, or moulded on hard material, such as stone, metal, or clay. Thus P. in the narrow sense of the word deals mainly with the softer materials on which handwriting, as distinguished from monumental engraving, has been inscribed; that is, with writing that is painted or traced in ink or colour, with a stylus, brush, reed, or pen, on such materials as paper, parchment, papyrus, linen, or wax. Still, there are certain exceptions, and sometimes P. has to inquire into the employment of metals, clay, potsherds, wood, and other writing materials. The line between P. and epigraphy is therefore not absolute. Typical examples of the border line are *ostraca* (documents written in ink on potsherds after the vases have been broken) and *graffiti* (wall-scribbings, discovered in large numbers at Pompeii).

On the other hand, the distinction between P. and epigraphy is less superficial than it may appear. The forms of written letters, similar at first to the engraved letters of the inscriptions, develop more swiftly, and with few exceptions the difference is maintained in all scripts. Writing materials have always played a great part in the external development of the single letters. Other

factors are as follows: (1) The necessity of speed in writing, assisted by innate laziness, produces the various cursive scripts. Under the pen of the expert scribe, who sought to save time, the letters naturally assumed less-exact shapes, as strokes were slurred, superfluities were dropped out, angles were curved; letters were linked together, these forms becoming similar to each other (so that it is hard to distinguish them); abbreviations were employed. (2) This tendency is counteracted by the reader's demand for clearness. In anct times writing not only served as an instrument of private communication, but it was also applied to the purposes of literature. No author would allow his writings to be pub. in a form which could not be perused with ease; thus neatly written books were essential, and with the necessity for multiplying literary works, the creation of a formal kind of writing suitable for books intended for the market was the natural result. (3) Aesthetic reasons: the study of the development of writing as dependent on aesthetic reasons is the subject of calligraphy. In some countries the profession of calligraphist was held in high esteem; indeed Chinese, Arabic, and Indian calligraphy has reached very high levels. According to some scholars, the importance of calligraphy in Christian MSS. was impaired by the development of the art of miniature. However, the desire for the writing to look beautiful on the whole makes for clearness, though in some cases it produces excessive uniformity, the scribe as it were forcing all the letters into one mould so that they should not spoil the regularity of his line or page. Naturally these various motives and inducements differed in relative strength with the purpose of the written document.

Hence the student of P., in its numerous branches (Indian, Greek, Latin, Hebrew, Arabic, etc.), generally distinguishes 2 classes of handwriting, the ordinary cursive script, or current hand, common to all and employed for everyday-life purposes, and the carefully written literary or book-hand, in which works of literature were usually written. The 2 classes, however, cannot always be kept absolutely distinct. Between them there might be a whole series of varieties which had some of the peculiarities of each group. For instance, a kind of book-hand might be employed by a trained scribe, often for some official reason, in drawing up a document which more usually would be inscribed in cursive characters; or cursive writing might be employed by a scribe copying books for private study.

In P. large letters are called *majusculae*, small letters *minusculae*. A variety of the capitals or majusculae of the Gk and Lat. monumental scripts is known as *uncials*, which are a modification of the monumental letters, in which curves are freely introduced as being more readily inscribed with the pen on soft material. Uncials are the ordinary characters used in early Gk papyri and vellum MSS., as well as the most anct extant forms of the

Lat. book-hand. They were doubtless the characters best adapted for calligraphy. The semi-uncial script, i.e. the mixed hand of uncials and minuscule letters, which was the main book-hand from the 5th to the 9th cents. AD, was easier than the uncials and more calligraphic than the cursive minuscule. The Gk and Lat. minuscule are derived from the majuscule. Although they already appear in the last centuries BC, a full minuscule alphabet was only slowly developed. Out of the Rom. cursive minuscule, various national minuscule arose (It. or Lombardic; Merovingian in France; Visigothic in Spain; Germanic; and particularly the Insular or Anglo-Irish hands). From the period of Charlemagne to the close of the 15th cent., the Caroline or Carolingian hand, to which is mainly due the blending of the majuscule and the minuscule, and later also the 'block-letter,' were the more important hands. The 15th cent. witnessed the dissolution of the later 'national' hands of the Middle Ages. The neat humanistic or renaissance hand, then introduced in Florence and employed for literary productions, developed into the: (1) Venetian minuscule known as *italica*, probably the most perfect form of letters and the most clearly legible which has yet been invented, and (2) the 'Rom.' type, perfected in N. Italy, chiefly at Venice. The monumental type of the Lat. alphabet, taken over for the majuscule, and both forms of the minuscule, the Roman and the *italica*, spread all over the world. In England they were adopted, from Italy, in the 16th cent.

The study of P., in all its branches, is of the greatest scientific and practical importance to ancient and medieval hist., to classical philology, to textual criticism, and to other branches of historical science. A particular branch of P. termed papyrology (q.v.) deals with the decipherment and interpretation of writings on papyrus. See also LETTERING.

In recent years there has been a revival of those styles of handwriting practised in 16th-cent. Italy, particularly by the great writing-masters of Rome and Florence. The so-called 'Chancery Script,' based on a 15th-cent. It. cursive hand adopted by Pope Nicholas V for the briefs written in the papal chancery, has been revived in Britain and the U.S.A., and is encouraged in some Eng. public schools. For an example of one of the original hands from which the modern styles have been developed, see VICENTINO, LODOVICO DEGLI ARRIGHI.

See E. M. Thompson, *Handbook of Greek and Latin Palaeography*, 1894, and *The History of English Handwriting*, 1901; W. Keller, *Angelsächsische Palaeographie*, 1906; E. Johnston, *Writing, Illuminating, and Lettering*, 1906; A. Fairbank, *A Handwriting Manual* (3rd revised ed.), 1948, *A Book of Scripts*, 1950; D. Düringer, *The Alphabet* (4th impression), 1953; P. Barry, O.S.B., *Handwriting Sheets*, 1954; J. Tarr, *Good Handwriting* (3rd revised ed.), 1954; also bibliographies of ALPHABET; MANUSCRIPTS; WRITING; GREEK

LANGUAGE; HEBREW LANGUAGE; LATIN LANGUAGE; etc.

Palaeolithic (Old Stone Age), see ARCHAEOLOGY; CAVE ART; FLINT IMPLEMENTS; STONE AGE.

Palaeologus, name of an illustrious Byzantine family, which first appears in hist. about the 11th cent. The family grew in power and importance until Michael P. became emperor of Byzantium as Michael VIII in 1261. He d. in 1282, but the dynasty he founded lasted for nearly 2 centuries. The line of the emperors after Michael VIII is as follows: Andronicus II (1282-1328); Andronicus III (1328-41); John V (1341-7); (John Cantacuzene ruled as John VI 1347-55); John V then ruled again (1355-76); Andronicus IV (1376-9), who deposed John V for that space of time; John V, who won the throne again from 1379 to 1391; Manuel II (1391-1423), whose co-ruler was John VII (1399-1412); John VIII (1423-48); and Constantine XI (1448-53), who fell in the siege of Constantinople by Mohammed II. The family also furnished rulers to sev. principalities, whilst a branch ruled in Monteferrat from 1305 to 1533. Andrew P., supposed to be a descendant of Constantine XI, was a claimant for the Byzantine empire, but resigned in favour of Charles VIII of France.

Palaeoniscids, a primitive Palaeozoic group of fresh-water chondrosteian ray-finned fishes, possessing a fusiform body, ganoid scales, and a heterocercal tail. Some were deep-bodied and lived in still waters. They lived from Devonian to Jurassic times, but were most abundant in the Carboniferous.

Palaeontology, science of fossils (q.v.) which deals with the life of past geological ages. As biology is subdivided into botany and zoology, so P. is regarded as consisting of Palaeobotany (q.v.) and Palaeozoology; the former deals with fossil plants, and the latter with fossil animals.

All the main categories of vertebrate animals (fishes, amphibia, reptiles, birds, mammals, man), including a large number of extinct groups, are represented in the fossil record, and can frequently be seen to grade into each other. The main groups of fossil invertebrates are as follows: (1) Protozoa (animals of the earliest type, such as foraminifera, radiolaria, etc.); (2) Porifera (comprising the sponges); (3) Coelenterata (including corals, stromatopora, hydrozoans, and jellyfishes); (4) Echinodermata (sea-urchins, starfish, crinoids, etc.); (5) Annelida and other kinds of worms; (6) Arthropoda (crustaceans, trilobites, arachnids and insects); (7) Bryozoa; (8) Brachiopoda; (9) Mollusca (lamellibranchs, gastropods, cephalopods); (10) Hemichordata (graptolites). Each of these phyla is broken up into classes and still further into orders, families, genera, and species. The fossils obtained from the rocks are generally more or less fragmentary, but from these fragments it is possible to form an accurate conception of the entire organism. From a single

tooth, bone, or shell fragment, the palaeontologist can form a fair conception of the complete organism. From the nature of the fossils the conditions of deposition of a geological formation can be surmised, the nature of the climates of past ages may be judged, and the physical configuration of the lands and seas of past time determined (see FOSSIL). To the biologist the study of fossils is of considerable importance, since not only are they the ancestors of modern species, but many groups now extinct (graptolites, trilobites, etc.) often throw light on the relationships of existing animals and plants. In some cases anct forms serve to connect groups which at present appear to be quite distinct, e.g. the earliest known bird, *Archaeopteryx* (q.v.), shows affinities with reptiles.

In spite of the imperfection of the record of life in past ages, the theory of evolution receives great support from palaeontological evidence. Many groups of animals undergo gradual modification when traced through series of strata. The early forms of life gradually become more abundant, deploy into various environments, become more specialised, reach their acme, and then die away again. A review of the fossils which are found in the geological systems reveals that there is a passage from the lower to the higher forms of life, each type becoming more and more specialised with the progress of time. Thus trilobites and lower forms of life occur in the Cambrian and Ordovician systems, fishes appear in the Silurian, amphibia in the Carboniferous, reptiles in the Permian, and birds and mammals in the Jurassic. On the other hand, some species, such as the brachiopod *Lingula*, have persisted almost unchanged from the Ordovician period up to the present day. See FOSSIL; PALAEOBOTANY; PALAEO-ECOLOGY; MICRO-PALAEOLOGY; EVOLUTION; GEOLOGY. The fossil hist. of man is dealt with under ANTHROPOLOGY and MAN. See C. A. von Zittel, *Text-book of Palaeontology* (trans. C. R. Eastman), 1900-2, and *History of Geology and Palaeontology*, 1901; R. S. Lull, *Organic Evolution*, 1917; A. S. Romer, *Vertebrate Palaeontology*, 1945; H. Woods, *Palaeontology: Invertebrata*, 1946; A. Morley Davies, *Introduction to Palaeontology*, 1947; H. H. Swinerton, *Outlines of Palaeontology*, 1947; ed. J. Piveteau, *Traité de Paléontologie*, 1952-5; R. R. Shrock and W. H. Twenhofel, *Principles of Invertebrate Palaeontology*, 1953; E. Neavever, *Stratigraphical Palaeontology*, 1955.

Palaeopolis, see ELIS.

Palaio-Siberian Languages, see LINGUISTIC FAMILIES.

Palaozoic (Age of Anct Life) includes the Cambrian, Ordovician, Silurian, Devonian, Carboniferous, and Permian geological systems. In the Lower P. the only fauna were invertebrates and fishes, whilst at the end of the age reptiles appeared. The characteristic fossils of P. times are the trilobites (q.v.).

Palaephatus, name (which is perhaps a common pseudonym) of sev. anct Gk

writers, 4 of whom are mentioned by Suidas (q.v.). The first was an epic poet, a native of Athens, who is said to have flourished before Homer. The second was a writer of Paros or Priene in the time of Artaxerxes Mnemon. The third was an historian of Abydos, the contemporary and friend of Aristotle. The fourth was an Alexandrian grammarian according to Suidas, or a peripatetic philosopher according to Tzetzes. For the last named see J. Schrader, *Palaeophalea*, 1893, and N. Festa, *Mythographi graeci*, lii. 2, 1902.

Palaestra. (Gk *palaistra*, a wrestling school), name of a public place which in Grecian times was appropriated to exercises in wrestling and athletics generally. These were under official control, and were especially, though not exclusively, for the athletes training for the public games.

Palafox y Melzi, José de, Duke of Saragossa (1780-1847), Sp. patriot and soldier, descended from a distinguished Aragonese family. He accompanied Ferdinand VII to Bayonne (1808), and on the latter's imprisonment headed the patriotic party in Aragon, and tried to prevent the Fr. invasion. His bold and courageous defence of Saragossa (1808-9) was one of the most brilliant exploits of modern hist., its fame rivaling that of the anct siege of Numantia. P. was imprisoned by the Fr. at Vincennes till 1813, and then returned to Spain. See C. Oman, *Peninsular War*, i, 1902.

Palagonite, isotropic glass, yellow, brown, or green in section, resulting from the alteration and hydration of basic glass or basalts. P. tuff is found among the products of the volcanoes of Sicily and Iceland, and has also been observed in the Carboniferous tuffs of central Scotland.

Palaic Language, see INDO-EUROPEAN LANGUAGES.

Palaioaphos, see PAPHOS.

Palamedes, Gk hero of the Trojan war, son of Nauplius of Euboea, his story belonging to the post-Homeric cycle of legends (see Stasinus's *Cypria*). He was deputed by the Greeks to induce Odysseus to join in the Trojan war. This he did by exposing the latter's feigned madness, thus incurring his enmity. He was falsely accused of treason by Odysseus, Agamemnon, and Diomedes, and stoned to death. See Philostratus, *Heroica*, 10; Euripides, *Orest.*, 422; *Frag.*, 581; Ovid, *Metam.* xlii. 56.

Palamedes, or Palomides, Sir, one of King Arthur's knights, the knight 'that is yet unchristened, who has many a bout with Sir Tristram,' mentioned in Malory's *Morte d'Arthur* (books ix and x).

Palanquin, type of litter used in the E., and carrying 1 person: the present form is a closed box, an earlier form being open. Poles are passed through rings, and the P. is carried by 2 or by 4 men.

Paladium, a genus of 6 trees, family Sapotaceae, native to Malaya, Ceylon, and India; *P. gutta* being the chief source of Gutta-percha (q.v.).

Palar, riv. of India, rises in Mysore and flows into the Bay of Bengal, S. of Madras. Its water provides irrigation,

and is supplied to the Kolar goldfields, the chief dam being at Aroot. Length 230 m.

**Palate**, roof of the mouth. It is composed of the *hard P.*, a bony structure covered with mucous membrane, and the *soft P.*, an aggregation of muscles covered with mucous membrane. The hard P. is formed by the palatine processes of the superior maxillary bones and the palatal bones. It has a slight ridge called the *palatine raphe* in the middle line which ends anteriorly in a little eminence called the *palatine papilla*; a number of ridges run transversely across the anterior portion of the P. The soft P. is composed of the muscles known as *tensor palati*, *azypos uvulae*, *palatoglossus*, and *palatopharyngeus*. A soft projection known as the *uvula* hangs downwards at the rear of the oral cavity. Behind the free edge of the soft P. is the pharyngeal isthmus communicating with the *naso-pharynx*. A ridge of mucous membrane runs from the soft P. to the edge of the tongue on each side, and is known as the *anterior palatine arch*. Another ridge forming the *posterior palatine arch* is situated about  $\frac{1}{2}$  in. to the rear, and between the two ridges is an oval mass of lymphoid tissue called the *tonsil*. See also CLEFT PALATE.

**Palatinate** (Ger. *Pfalz*), former ter. of Germany, originally consisting of a dist. on the Rhine (q.v.) around Heidelberg (q.v.). This dist. was subsequently (1329) united with a portion of Upper Bavaria later known as the Upper P. In 1156 it was granted by the Emperor Frederick I to his step-brother, Duke Conrad of Swabia, succeeded by Duke Henry of Brunswick. Frederick II took away the P. from the latter in 1215 and gave it to Louis, Duke of Bavaria, whose son Otto married Agnes, the daughter and heiress of Henry. Thus the P. came into the possession of the Bavarian family in whose hands it remained until 1559, when the line became extinct. Frederick III of the Simmern dynasty, who associated himself with the Reformed Church, then became ruler of the P.; and Heidelberg, the cap. of the electors palatine, became a great centre of Calvinism. In 1648 the Lower P. was given to Charles Louis, the son of Frederick V (q.v.), and a new or eighth electorate was created in his favour. During the War of the Sp. Succession John William, the elector of the Lower P., received the Upper P. also, but the latter was restored to the elector of Bavaria at the end of the war. On the death of the Elector Maximilian Joseph, the last of the Bavarian male line, in 1777, the two P.s were reunited. In 1801 the portions of the Rhine P. on the l. b. of that riv. were taken by France, Baden received Heidelberg, Mannheim, etc., and the rest fell to Hesse-Darmstadt, Nassau, etc. By the treaties of Paris of 1814 and 1815 the P. was again divided up, the greater portion being granted to Bavaria and the rest to Prussia and Hesse-Darmstadt. Later the diminished Lower P. formed a dist. of Bavaria, with Speyer (q.v.) as cap. The Upper P. formed a dist. of Bavaria under the title of Upper P. and Regensburg, with Regensburg (q.v.) as cap. Lower P. is

now part of the *Land of Rhineland-P.* (q.v.), and Upper P. of the *Land of Bavaria* (q.v.).

**Palatine** (Lat. *palatium*, a palace). A count P. was, under the Merovingian kings of France, a high judicial officer. After the time of Charlemagne a similar title was given to any powerful feudal lord to whom a prov. was made over with judicial powers, and the dist. so governed was called a palatinate or co. P. There were 3 co. P. in England (Lancaster, Chester, and Durham), which were made separate regalties on account of their respective proximity to the frontier of Wales and to that turbulent Northumbrian prov. which could not be accounted a portion of either England or Scotland. In virtue of their regal rights, the counts P. had their courts of law, and could pardon treasons, murders, and felonies. Lancaster was probably made a co. P. by Edward III. Henry VI was hereditary duke and count P. of Lancaster, and on his attainer the duchy and co. were forfeited to the Crown, and conferred on Edward IV, afterwards on Henry VII and his heirs for ever. There is still a chancellor of the duchy and co. P. Chester is said to have become a co. P. when made over by William the Conqueror to Hugues d'Avranches. In the reign of Henry III it was annexed to the Crown by letters patent, and since that time has been vested in the eldest son of the sovereign, or in the Crown. Durham seems to have first become a palatinate when William the Conqueror conferred upon Walcher the bishopric and dukedom of Durham. The palatinate jurisdiction continued united with the bishopric till 1836, when it was vested in William IV and his successors. Pembroke was at one time a co. P., but ceased to be so in Henry VIII's reign. In very early times there were a number of similar privileges in Scotland.

**Palatine Hill** (*Mons Palatinus*), hill on which, according to tradition, Romulus founded the city of Rome (q.v.), the Capitoline Hill being occupied by Sabines. The P. H. is SE. of the Capitoline and NNE. of the Aventine; traces of its fortifications are still visible. In later times it was the seat of the imperial residence, whence the Eng. words 'palace' and 'palatial.'

**Palau, or Pelew, Islands**, group of the W. Caroline Is. in the W. Pacific Ocean. Lat. 2°-9° N.; long. 130°-135° E. There are 26 is., of which 6 are inhabited. The largest is Babeltop (Babelthuap), and next in order are Korror, Arguar, Pelelin, and Eilmalk. The total area is about 190 sq. m. The group is surrounded by a coral reef. The is. are mountainous, well watered, and fertile. They were sold to Germany by Spain in 1899. In 1914 they were occupied by Australia, and the treaty of Versailles placed them under Jap. mandate. After forming a major Jap. base during the Second World War, the P. I. came under U.S. trusteeship for the U.N. in 1943. Pop. 6200.

**Palawan**, formerly *Paragua*, one of the Philippine Is., to the W. of the group, between the China and Sulu Seas. The

is., which has a length of 275 m. and a breadth of 25 m., acts as a sort of breakwater, whence its name (meaning 'shulce' in Bulj language). The chief products are coconuts, rice, rubber, sugar, and timber. Cattle are raised, and there are manganese mines. It was developed as an air base by the Japanese, who occupied it from May 1942 until March 1945. Area 4550 sq. m.; pop. 43,813. Cap. Puerto Princesa (pop. 15,177).

**Palazzo San Gervasio**, It. tn, in Basilicata (q.v.), 23 m. NE. of Potenza (q.v.). Pop. 9000.

**Palazzolo Acreide** (anc. Akrai), tn in Sicily (q.v.), 22 m. W. of Syracuse (q.v.). It was founded in 661 BC and has remarkable Gk remains. Pop. 13,000.

**Palazzolo Sull'oglio**, It. tn, in Lombardy (q.v.), 18 m. NW. of Brescia (q.v.). It has a trade in textiles and agric. produce. Pop. 12,100.

**Pal'chinskij, Pëtr Ioakimovich** (d. 1930), Russian engineer and politician. Before the First World War he played an important role in technocratically minded industrial circles. During the war he was a leading member of the Central War Industries Committee, and after the February revolution (q.v.) in 1917 was Deputy Minister of Trade and Industry in the Provisional Gov. (q.v.). P. defended the seat of the gov., the Winter Palace, against the Bolsheviks in October (see OCTOBER REVOLUTION). He later worked in the State Planning Commission, but was accused of sabotage and shot. In 1930 P. was alleged to have set up an underground League of Engineering Organisations which later developed into the Industrial Party.

**Pale, The, or The English Pale**, name applied to that part of Ireland in which Eng. law was acknowledged. The dominion of England was for some centuries after the conquest of Ireland by Henry II restricted to the P., the boundaries of which varied, but which included Kildare, Louth, Meath, and Dublin (qq.v.). The P. as an entity disappeared when Ireland was completely occupied in Elizabethan times. See IRELAND, History; see also E. Curtis, *A History of Ireland*, 1937.

**Palekh**, settlement, former vil., in the Ivanovo oblast of Central Russia, 35 m. SE. of Ivanovo. Since the 16th cent. it has been the centre of ikon painting in Russia, and since 1922 the painting of lacquered papier mâché articles has been carried out. P. painters have restored the frescoes in the cathedrals of the Moscow Kremlin (since 1946).

**Palembang**, tn of Sumatra, Indonesia, 45 m. from the mouth of the Musi, or P. R. P. is the most important commercial city in the is., and is a trade centre for areas producing rubber and oil; contains oil refineries, iron foundries, and shipyards. Exports include petroleum products, rubber, timber, coffee, etc. There is an airport. P.'s output of 4,250,000 tons of petroleum annually in the years before the Second World War represented 55 per cent of the net total output of the Netherlands E. Indies. In 1948 P. was cap. of

the temporary autonomous state of S. Sumatra; it became part of the Rep. of Indonesia in 1950. Pop. 109,000.

**Palencia**, Alfonso de, or Alphonsus Palentinus (b. c. 1423, d. after 1492), Sp. historical geographer. He studied under George of Trebizond in Italy, and became historiographer to Isabella of Castile. His works include a *Chronicle of Henry IV*, 1454-74; and *Decades* (in Latin, down to the taking of Baza from the Moors), 1491.

**Palencia**: 1. Sp. prov., in León (q.v.). It is a high, open plateau, lying S. of the Cantabrian Mts (q.v.), and has a severe climate. There are many fertile valleys of the Carrion and other tribs. of the Duero (q.v.). Grain, wool, wine, and honey are produced. Area 3257 sq. m. Pop. 237,550.

2. (anc. Pallantia) Sp. tn, cap. of the prov. of P., on the Carrion. It has a fine Gothic cathedral, begun in 1321, containing paintings by El Greco and Zurbarán, and sev. other interesting churches. The first univ. in Spain was founded here in 1208, but was transferred to Salamanca in the same century. Rolling-stock, agric. machinery, textiles, pottery, and soap are manuf., and there is a bell-foundry. Pop. 43,900.

**Palenque**, vil. of Chiapas, Mexico. It is celebrated for its ruins of anc. temples, the finest of which is called the Great Palace. There are 10 detached buildings in all, amongst which are the Temple of the Cross, the Temple of Inscriptions, and the Temple of Beau Relief.

**Paléologue, Georges Maurice** (1859-1944), Fr. author and diplomat, b. Paris, of an old Byzantine family (see PALAEOLOGUS). Educated at the Lycée Henri IV, he held diplomatic posts in Tangier, Rome, Germany, China, Korea, and Bulgaria, was ambas. to Russia, 1914-1917, and secretary-general of the Ministry of Foreign Affairs, 1920-1. His pubs. include *L'Art chinois*, 1888; *La Russie des tsars pendant la Grande Guerre*, 1921-2; *Le Roman tragique de l'Empereur Alexandre II*, 1923; *Cavour*, 1926; *Les Entrepreneurs de l'Impératrice Eugénie*, 1928; *Guillaume II et Nicolas II*, 1935; *Alexandre I*, 1936. His secret diary on the Dreyfus case 1894-9 was pub. posthumously and trans into Eng. 1957. In 1928 he was elected to the Academy.

**Palermo**: 1. Prov. of Italy, in NW. Sicily (q.v.). It is mountainous, with the riv. valleys of the Torto, S. Leonardo, and Belice. The long coast-line on the Tyrrhenian Sea has extensive bays and bold promontories. The coastal plain is narrow except for the fertile Conca d'Oro in the NW. The prin. tns include P., Partinoco, Bagheria, and Castelbuono (qq.v.). Area 1920 sq. m.; pop. 1,072,000.

2. (anc. Panormus) It. seaport, cap. of the prov. of P., and chief tn of Sicily. It is on the N. coastal plain of the Conca d'Oro, on a bay of the Tyrrhenian Sea. Of Phoenician origin (see PHOENICIA), P. later became a stronghold of Carthage (q.v.). It was subsequently taken by Pyrrhus (276 BC), the Romans (254 BC), the Vandals (AD 440), Belisarius (535),

and the Normans (1071) (q.v.). In the time of the Emperor Frederick II (q.v.) it made an important contribution to lit. literature (see ITALIAN LANGUAGE AND LITERATURE). There was severe damage, particularly to the harbour area, during the Second World War. P. has a magnificent Gothic archi-episcopal cathedral (12th-16th cents.) containing 6 royal tombs, including that of Frederick II. There are other fine churches, a royal palace, a univ. (1777), a picture gallery, and a museum. The harbour is good, and there is a splendid promenade stretching for a mile along the bay. Tobacco, glass, furniture, and machinery are manuf., there are iron foundries, and there is a trade in fruit, nuts, wine, and olive oil. Pop. 501,000. See C. Diehl, *Palermie et Syracuse*, 1907.

**Palestine**, city and the cap. of Anderson co., Texas, U.S.A., 151 m. N. of Houston. It has a cotton compress and iron foundries. Pop. 12,500.

**Palestine**, anct and biblical country lying at the extreme E. end of the Mediterranean, to the S. of Syria. It forms a NW. strip of Arabia balancing the SE., El Yemen. The commonest term for it in the Heb. Bible is 'the Land of Canaan' (*Eres Kena'an*). It is also known as the Holy Land, as the Land of Israel (*Eres Pizrael*), and, in part, as Judaea. The term P., a Gk word (*Palastine*), which means 'Philistine-land,' is used for the whole country first by Herodotus (5th cent. bc). Originally, however, the term P. (Heb. *Pelesheth*) was applied to the mere strip of coast lying between Jaffa and Gaza (see Exod. xv. 14), but, like the term Canaan and other geographical terms, it was gradually employed to denote the whole country.

**BOUNDARIES.** P. is a historical-geographical expression rather than a political entity. The area contained within its boundaries varied from time to time. The natural and historic boundaries of P. run on the S. from the gulf of Aqabah across the desert of Sinai to the Mediterranean coast. Desert country borders its E. frontier also. Its W. limit is the Mediterranean Sea. The N. limits are difficult to determine; it may be said, however, that they run from the desert on the E., along the slopes of Mt Hermon over to the Litani R. and where the Lebanon and Anti-Lebanon first break into a series of elevated plateaux, and thence over to the Mediterranean coast. P. is about 150 m. in length from N. to S., with a width of about 35 m. at the N. and about 40 m. at the S., its area being about 10,000 sq. m. (approximately that of the Netherlands). Under the Brit. mandate P. was bounded on the N. by the Fr. mandated ters. of Syria and Lebanon, on the W. by the Mediterranean, on the S. by Egyptian ter., and on the E. by Transjordan, though this was also included in the Brit. mandate. The N. boundary was settled by an Anglo-Fr. convention of 1920, and ran from the Mediterranean, between Tyre and Acre, across the Upper Jordan valley to Banias, and thence again S. to the NE. shore of Lake Tiberias

and to Samakh. Since 1948, the country has been divided between Israel, Jordan, and Egypt, about four-fifths of the total area being in Israel.

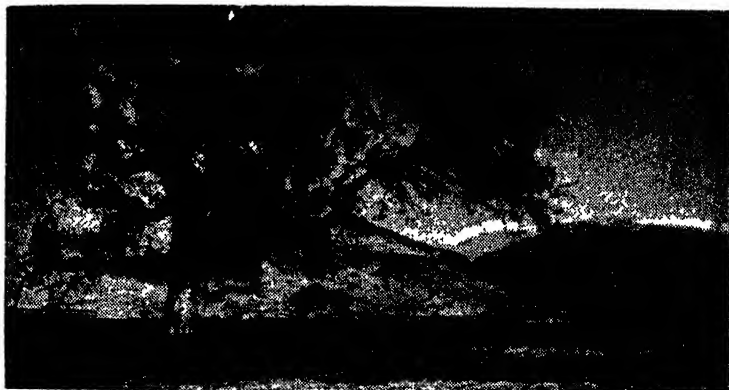
**HISTORICAL-GEOGRAPHICAL SETTING.** Though the country was small, its situation was and still is one of very great strategic importance. P. forms a bridge between Asia and Africa, and in anct times it formed the main communication between the great empires of Babylon and Assyria, important centres of civilisation on the Tigris and Euphrates, and Egypt, which through many centuries was one of the great world powers. P. was the bridge over which flowed all the traffic between these great commercial powers. Another stream of traffic, less considerable, crossed the country in another direction, from S. Arabia to Phoenicia. Culturally, also, P. drew continuously from Egypt and the valley of Euphrates, and as nearly all important elements of anct culture originated in one or the other of these 2 centres, P. became acquainted with all significant developments of anct E. civilisation. But not all the traffic that passed over the bridge was peaceful. The rivalry between Egypt and the Mesopotamian powers was inveterate. Whenever their armies advanced to attack one another the route led necessarily through P.; therefore P. became an international battle-ground and a pawn in the game of war. It is this position, with its fundamental significance, also in its later hist., which renders P. unique. P. has, besides, always been the 'refuge of the drifting populations of Arabia.' Never sought for itself alone, except by the Hebrews and the crusaders, P. has been overrun constantly by invaders from the N. seeking Egypt, or by the return attack. Thus the Hittites, Egyptians, Assyrians, Babylonians, Persians, Greeks, Syrians, Arabs, and Seljuk Turks in turn devastated it. Alexander passed through to Egypt in 331 bc; the wars of the Seleucides and Ptolemies passed over it; Pompey in 63 bc brought it under Rom. rule; the crusaders estab. themselves there from 1099 to 1187; Napoleon in 1799 abandoned his first ambition on its soil. Yet its destiny was typified by the Arab conquest in AD 640; there is everything to attract the desert tribes, but nothing for others except the religious sentiment of Christians and Jews, which later, linked with national consciousness, has given the latest impetus to the hist. of P. (see *Modern History*).

**PHYSICAL FEATURES.** The land divides simply into the Maritime Plain (subdivided into the fertile plain of Sharon, from Mt Carmel to Jaffa, and the sandy plain of Philistia, to the S.) along the coast, the Shephelah or low hills, the Central Range, the Jordan valley, and the E. Range; the Central Range is further broken by the plain of Esdraelon between Galilee and Samaria, and falls away steadily and broadly as the Negeb or S. country. N. of Esdraelon this range runs up to the mts of Lebanon, of which indeed it is the S. extension. In the N. of Galilee its peaks reach a height of



about 4000 ft. The main divs are based on the geological formation; limestone rocks form 2 folds with a great synclinal valley between the valley of the Jordan; the cretaceous limestone of the Central Range passes under the calcareous sandstone of the Shepholah, which is overlaid by the raised beaches and sea-beds of the Maritime Plain. The Jordan valley forms a deep fault in the earth's crust. From the small lake Huleh (q.v.), just above sea-level, the R. Jordan runs in a narrow valley, dipping so steeply that on reaching the sea of Galilee it is almost 700 ft below sea-level. The descent continues, but not so steeply; the riv., however, contrives in its wanderings to travel about three times the actual

Sea, has 3 rivs., the Arnon, Jabbok, and Yarmuk, flowing due W. into the Jordan. Hauran, corresponding to the anct Trachonitis and Auranitis, a volcanic region covered with a basaltic lava, and showing characteristic denudation, lies N. of the Yarmuk and is partly (in the N.) barren. The tableland rises steeply to 2000 ft, the W. wall sloping more gradually to between 800 and 1500 ft of the Central Range. To the E. there is the Hauran mt range, now the home of the Druses. Jaulan, to the W., corresponds to the Gk Golanitis. The S. part of the Hauran is well watered, and probably coincides with the dist. known in the Bible as Bashan and later as Batanea. This was regarded by the Hebrews as an especially fertile



*Jewish National Fund*

A GALILEAN LANDSCAPE: ON THE RIGHT IS MOUNT HERMON

distance (which is about 65 m.) between the sea of Galilee and the Dead Sea (q.v.). The latter is 1292 ft below sea-level. S. of the Dead Sea, in which the riv. loses itself, the valley (known as Wadi 'Arabah (Arabian Ghôr)) continues through the desert and gradually rises to the head of the Gulf of Aqabah. There are hot springs in the bed of the Dead Sea, and the strata are bituminous; in addition, there is no outlet, and evaporation leaves the water both dense and bitter. Its banks are largely of marl fringed with clean gravel. Within the Ghôr and about the Dead Sea were the 'five cities,' Sodom, Gomorrah, Admah, Zebolim, Zoar. The Ghôr has a tropical heat and rank vegetation, thorn bush and broom, and jungle of cane and oleander; it abounds in marsh with its accompanying malaria. Jericho has been its only tn. Beyond these main natural divs., again, the land is cut up into distinct and separated parts well reflected in the anct tribal divs., and giving an independent character productive of internal unrest.

*East Palestine* (see also TRANSJORDAN), from Hermon to the S. end of the Dead

area. Between the Yarmuk and the Jabbok (Zerqa) are forested high ridges, the Gilead of the Bible, the Galaaditis of the Greeks, while S. again lies the treeless plateau of Moab, with Ammon to the NE. This whole dist., called by the Arabs El Belka, was known in Rom. times as Peraea; then it was Jewish, while the ter. N. of the Yarmuk was mainly pagan.

**HYDROGRAPHY AND VEGETATION.** The hydrography of P. is typical of limestone country, with the addition of summer drought. The streams are plentiful and full in the hills in the rainy season, but soon become dry; in the Maritime Plain surface water is scarce, but is readily obtained by digging. Judaea has few springs, and water is stored in wells from the winter rains. As a consequence of this irregularity, the soil and vegetation are similarly varied, from the tropical vegetation of the Jordan valley to the barren moorland and desert. W. of Jordan the land is park steppe tending towards scrub. Trees include the oak, terebinth, carob, box, pine, cypress, plane, walnut, sycamore, palm, acacia, and shittim-wood. Much of the woodland consists of dwarf

trees, the wild olive, vine, arbutus, myrtle, juniper, and thorn. Of fruit there is plenty: the apricot, fig, orange, date, citron, pomegranate, mulberry, pistachio, almond and walnut, olive and grape. Wheat, barley, millet, maize, beans, pulse, lentils, tomatoes, onions, cucumbers, pumpkins, and melons are cultivated; but pasture is wild, short-lived, and sparse, though of excellent quality.



*Photo: Paul Popper*

#### THE RIVER JORDAN

(Photo from *The Bible as History*, by Werner Keller, published by Hodder and Stoughton Ltd.)

**CLIMATE.** There is every range of climate from the sub-tropical of the lower Jordan to the sub-alpine of the upper. On the Maritime Plain one is in Egypt; in the Shephelah in Italy; Judaea resembles inland Italy, and Moab inland Algeria. However, even in the winter the temp. only exceptionally falls below freezing-point. There are two seasons: the winter rains, commencing about Oct. and lasting till April, with typical desert fringe thunderstorms and hail, and snow on the mts; and the summer drought, with occasional morning mists, and regular heavy dews at night, while the heat of the day is sultry. The rains are brought by SW. and W. winds, the drier NW. blowing in the summer, and with an approach to land and sea-breeze conditions. In spring the Sherkiyeh (sirocco) or Khamasin, the hot desert wind, is common. The temp. tends to extremes and sudden changes, but in Judaea is more equable;

here the mean ann. temp. varies from 62° to 68°; 90° in summer, 46° in Feb. Throughout the land the climate is healthy, bracing, regular enough to induce steady labour, variable enough to produce anxiety and care. The lower Jordan valley, cut off from the sea breezes, is intensely hot. This heat causes rapid evaporation from the sea of Galilee and, especially the Dead Sea, and explains the fact that despite the millions of tons of water which the latter receives daily from the Jordan, its level does not rise.

**ARCHAEOLOGY.** Archaeology and hist. in P., as elsewhere, are complementary and interdependent studies. Various museums in Europe, America, and Asia preserve Palestinian antiquities; the most important of them is the P. Museum of Jerusalem, built with a gift of \$2,000,000 from John D. Rockefeller, junior.

P. has always been a lure to the archaeologist, especially for those who have worked to establish the historical accuracy of the Scriptures. Sober appraisal should be made of the nature, extent, and limits of the actual contribution which archaeology makes to our better understanding and true appreciation of the Bible. The great spiritual experiences deposited in the Bible cannot be tested by any material, historical, or literary evidences. On the other hand, the brilliant achievements of the last decades in the field of Palestinian archaeology have greatly added to our knowledge of the world in which Israel was set. Archaeology fills many gaps in the Bible, explains and illustrates many passages which would otherwise remain obscure.

Scientific surface exploration of P. may be said to have begun in 1838. In that year the Amer. theologian Edward Robinson, prof. at the Union Theological Seminary of New York city, started his extensive observations, which he continued until 1852. In 1865 the P. Exploration Fund (q.v.) was estab., and its first representative, Charles Warren, a Brit. ordnance officer, made a series of sketch-maps of the country, and (in 1867) carried out excavations on the Temple hill of Jerusalem. In the years 1872-8 the P.E.F. made a thorough survey of W. P. under the leadership of C. R. Conder and H. H. Kitchener (Lord Kitchener). The Amer. P. Exploration Society, in 1870, and, in 1898, the Deutsche Orient-Gesellschaft, as well as various other European and Palestinian societies, were founded on the model of the Brit. organisation. W. M. Flinders Petrie, who in 1890 excavated the mound (or tell) of Tell el-Hesi, in SW. P., may be considered as the father of modern archaeology of P. There was considerable archaeological activity in P. in the years following the First World War; from 1921 to 1936 no year passed without sev. excavations. The lead was then taken by Brit. organisations (P.E.F., Brit. School of Archaeology, Wellcome Archaeological Expedition, etc.), often in co-operation with Amer. organisations (Amer. School of Oriental Research, Univ. of Chicago, etc.) or the Heb. Univ. of Jerusalem.

Among the most notable excavations carried out recently are those by the Univ. of Pennsylvania Museum at Bethshan (1921-33), by the P.E.F. and the Brit. School of Archaeology on the Ophel hill in Jerusalem (1923-8), by the Univ. of Chicago at Megiddo (1925-39), by Prof. Garstang at Jericho (1929-36), by the Amer. Schools of Oriental Research in Jerusalem, directed by Prof. W. F. Albright, at Tell el-Nasbeh (1926-35), at Tell Beit Mirsim (1926-32), by Prof. Elihu Grant at Beth Shemesh (1928-33), by the Brit. School of Archaeology in Jerusalem and the Amer. School of Prehistoric Research at Mt. Carmel (1928-34), by Flinders Petrie at Tell el-Ajjul (anc. Gaza) (1930-4), Tell Jemmeh, and Tell el-Far'ah, by the joint Brit.-Amer.-Heb. Univ. expedition at Samaria (1931-5), by the Wellcome-Marston Expedition at Lachish (Tell ed-Duweir) (1932-8), where the famous 'Lachish Letters' were found, and numerous shorter excavations. The Jewish P. Exploration Society has excavated at Beth Shearim (modern Sheikh Abrik) (1936-40), Khirbet Kerak (= anc. Beth Yerah) (1944 onwards), and more recently at the Biblical city of Hazor and the Herodian fortress of Masada. The most important discovery which has ever been made in regard to biblical MSS. was in the summer of 1947, when a number of MSS. were found in an anc. cave in the cliffs above the Dead Sea. It is taking the scholars many years of study to exhaust all the implications of this remarkable find. See *SCROLLS OF THE LAW*. In 1953 Miss K. Konyon made important prehistoric discoveries at Jericho going back to c. 5000 bc. Excavations continued in succeeding years.

**PREHISTORY.** Our historical information concerning P. before the time of the Hebrews is very limited. Indeed, the hist. of P. in the ordinary sense does not go back farther than the second millennium bc. Such information as can be gathered about the earlier times is derived almost exclusively from the discovery of excavators and the research work of geologists and archaeologists (see preceding section). It seems that in the Tertiary Age P. rose above the sea, and after much oscillation attained what were roughly its present boundaries; and less than 2,000,000 years ago the tectonic movements in the earth's crust culminated in the great cleft which is known in its modified form of to-day as the Jordan valley; at the same time upheavals of rock deposits created the hill country of W. P.

P. appears to have been inhabited at a very remote period. The earliest inhab. belonged to the Early Palaeolithic period; they lived in caves in which they left traces of their occupation. The oldest cave deposits are assigned to the Acheulian phase (perhaps 180,000 years ago). On Mt. Carmel, in a Middle Palaeolithic cave deposit (belonging perhaps to 150,000 years ago), a dozen human skeletons were found, and sev. more were discovered in a cave S. of Nazareth. The Carmel man seems to

represent a mixed race, intermediate between Palaeolithic man (*Homo neanderthalensis*) and Neolithic man (*Homo sapiens*). There followed various Late Palaeolithic and Mesolithic phases, each one lasting many thousands of years.

Of Neolithic men in P. (perhaps 6000-4500 or 4000 bc.) much more is known. They left behind them numerous monuments of stone such as menhirs (q.v.), dolmens (q.v.), and cromlechs (q.v.), possibly the biblical *gilgal*. Perhaps about 4500 bc. copper made its first appearance in P.; gradually it became more abundant, and partly replaced stone as a material for tools. This period is known as Chalcolithic, i.e. 'copper (or bronze)—(and) stone'; it was the transitional period between the Neolithic and Bronze Ages. Whatever may be the case with the Palaeolithic inhab. of P., according to Prof. Albright, the leading Amer. orientalist, Hamito-Semitic tribes already appear during the Mesolithic period, nearly 10,000 years ago, and (although later there were many movements of non-Semitic peoples across P.) the Semitic element remained primary in the ethnic make-up of P. ever since. The true hist. of P. begins with the invasion of the Israelites in the 13th cent. bc. (after their exodus from Egypt), and with the invasion of the 'Sea Peoples' in the early 12th cent. bc. (see below).

**ANCIENT HISTORY.** (For the traditional hist. of the Israelites see *under ISRAEL*.) By 1100 bc. the Israelites had occupied most of the hill country in P., and they were already distinguished from the Phoenician people of the coast and the Semites of the desert beyond the Jordan by their peculiar religion. Hostile pressure, especially from the Philistines, led to the setting up of a monarchy; and under David (c. 1000-970 bc.) and Solomon (c. 970-930 bc.) the Israelites were effectively united, the Philistines and other enemies defeated, and the power of the new kingdom was extended over all P. But on Solomon's death a decline set in. The coastal people regained their independence; the N. tribes estab. a separate kingdom of Israel centred on Samaria, often at war with the kingdom of Judah, in which, principally because Solomon's temple in Jerusalem was the visible symbol of the Heb. faith, the tradition of Heb. culture was thenceforth mainly concentrated. This 'partition' of P. rendered easier its subjection to whichever should become the stronger of the neighbouring empires, Egypt or Assyria. The two Israelite kingdoms and the coast tns, however, succeeded in keeping a precarious independence for 2 centuries, but in 721 the first blow fell. The N. kingdom became merged in the Assyrian Empire, Samaria was destroyed, and the wealthier sections of the people were deported to other lands. By 586 bc. Judah suffered a like fate. Jerusalem was sacked and deprived of its defences and equipment and a great part of the pop. removed to Babylon. The 'captivity,' however, did not last long, for in 538 bc. Cyrus allowed the Judean exiles

to return to their country and some 40,000 returned to their homeland, rebuilt the temple, and reconstituted their life in a small inland state. Our evidence for the hist. of P. during the Persian period (538-330 bc) is both confusing and scanty. It seems, however, that there was a semi autonomous state called Yehud (Judaea). After the conquest of P. by the Seleucid rulers of Syria came the earliest persecution of the Jewish faith, but under the lead of Hasmonians or Maccabees the Jews revolted, and from 142 bc recovered the long-lost independence of Judaea and even extended their rule almost to the old limits of David and Solomon. Then in 63 bc Pompey stormed Jerusalem. The Jews, however, were determined not to yield without a struggle, and in ad 66-70 Titus concluded a long and difficult campaign by sacking Jerusalem and destroying the temple. After crushing a further revolt in ad 132-5 the Romans ploughed the site of Jerusalem and drove many of its people into slavery. Jewish religious life continued to develop (see MISHNA; TALMUD), and Christianity made some progress.

**MEDIEVAL HISTORY.** For over 500 years P. remained under Rom. or Byzantine rule, except for a short period of Persian domination; and then, in the 7th cent., the Arabs, inspired by the rise of Islam, in their great Mediterranean conquests included Syria, which also embraced P. But whatever the achievements of the golden age of Arab rule, P. played no great part, and the only outstanding work of art which has survived from the age of Arab independence is the Dome of the Rock, erected at the end of the 7th cent. But in one respect Jerusalem attained a higher place in the Arab world than Bagdad, Granada, or Cairo: Mohammed placed the scene of his ascent to heaven on the site of the Jewish temple in Jerusalem. In the course of the next 400 years the Arab empire disintegrated, and from ad 1099 P. was exposed to the series of invasions known as the crusades, which maintained a precarious kingdom of Jerusalem until the late 12th cent., after which most of P. reverted to Muslim rule. In 1291 the crusaders lost their last foothold at Acre. In 1517 P. was conquered by the Ottoman Turks, and under the rule of the Ottoman sultans at Constantinople it remained, except for a few months of Napoleon's invasion and the few years of Mohammed Ali's occupation, until the First World War.

**MODERN COLONISATION.** Prior to the First World War the Germans made sev. attempts at colonisation, notably at Haifa and Jaffa, and many Jewish colonies were estab. at Petah Tiqva, Rishon-le-Ziyyon, Gadera (settlements for wine and orange cultivation), lower Galilee (between the years 1901 and 1907), and mixed farming settlements under the Zionist organisation at Daganian, Tel Hai, Kinnereth, and elsewhere; Circassian colonies existed (and still exist) at Jerash, Amman, and elsewhere in Transjordan (q.v.). These colonies made a beginning towards

the restoration of the land to its former flourishing condition. There was also an appreciable increase in philanthropic, educational, missionary, and monastic settlements. The Jordan valley S. of the sea of Galilee became the private property of the sultan, and some improvement took place there. After 1921 there was a wide extension of the colonisation of the Zionist organisation to large connected areas, especially in the vale of Esdraelon (q.v.).

**MODERN HISTORY.** *Palestine under British Mandate:* P. was taken from the Turks in 1917 by Gen. Allenby (q.v.) (see PALESTINE, OPERATIONS IN). The Brit. conquest paved the way for the Balfour Declaration offering the Jews a national home in P., and this historic declaration, far-reaching in its consequences and repercussions, was endorsed by the allied powers in the treaty of Sevres, 1920, which provided that the country should be entrusted to a mandatory power under the League of Nations. At San Remo, in 1920, the Allied Powers' Supreme Council entrusted the mandate to Great Britain. A body, then styled the Zionist Commission, and consisting of representatives of the constituent federations of the World Zionist organisation, was set up to act as a link between the Brit. administration and Zionist interests. This body was known as the P. Zionist Executive. It was financed by Jews all over the world and did valuable work in the interests of Jewish education, agriculture, and colonisation in P. The Brit. military administration (1917-20) conferred many benefits on P., including sanitation, public gardens, and chambers of commerce. Large sums were spent on road improvements, bridges were rebuilt, and a steel bridge was thrown across the Jordan. There were occasional minor disturbances early in 1920 in various parts of P. Again, in 1921, there was rioting in Jaffa, which developed into racial strife, but no serious outbreak occurred until 23 Aug. 1929, when grave disorders broke out in Jerusalem over the Walling Wall (q.v.). Similar disorders were especially grave in Hebron, but also spread to other parts of the country, order being restored, however, by the end of the month, after troops had been sent from Malta and Egypt. A commission was set up by the Brit. Gov., under the chairmanship of Sir Walter Shaw, to inquire into the causes of the outbreak and to make recommendations as to the steps necessary to avoid a recurrence. (Report, Cmd. 3530.)

From then until the outbreak of the Second World War the administration of P. was overshadowed by Muslim-Jewish hostilities, which presented formidable difficulties to the mandatory. At times the Brit. Gov. seemed to lean in favour of the Jews, and at other times to discourage the Jews in favour of the Arabs.

The immigration of Jews was always regarded with the greatest hostility, overt or otherwise, by the Arabs. In 1932 immigration rose to 9553, the first of 4 consecutive leaps which were to transform the situation by the beginning of 1936.

growth of immigration went a capital invested in the amount of the national home, especially by Amer. Jews, and in its agric. and industrial production. Meantime, however, the economic position of the Arabs continued to improve. But the Arabs began to claim that they had been displaced from lands owing to Jewish purchase, especially from absentee Arab landowners, and ordinances were passed to check this tendency, which might eventually have created a large landless Arab proletariat. There was relative tranquillity in P. between 1930 and 1933, but under the quiet surface was smouldering a fierce Arab antagonism to the whole conception of the national home. In 1933 Jews fleeing from Germany under the Nazi regime sought asylum in P., and in that year immigration jumped to 30,327, 5392 coming from Germany and 13,125 from Poland, and the national home benefited in every way materially. In 1934 there were no fewer than 42,359 'authorised' Jewish immigrants, and in 1935 61,854. The principle of 'economic absorptive capacity,' laid down over 10 years previously, was almost stultified, for the Jews now claimed that this enhanced immigration in itself actually increased that capacity, and the Arabs naturally supposed that at no great distance of time they might find themselves outnumbered. It became evident that the longer the mandate operated, the stronger and more bitter became Arab opposition. The various Arab political parties jointly demanded the estab. of a democratic gov., the prohibition of land transfer to Jews, and the cessation of Jewish immigration. The two latter demands were precluded by the mandate, unless it could be shown that land purchase and immigration were definitely injuring the rights and position of the Arabs; while as to the first demand, the gov. temporised by bringing forward a proposal (the second since the mandate) for the estab. of a legislative council. The Arabs, in a spirit of perversity, accepted the proposal only because the Jews were opposed to it, for it was clearly far removed from the Arab ideal of independence. It was, however, rejected by the Brit. House of Commons.

In such circumstances it is not surprising that in 1936 the disturbances broke out which occasioned the appointment of the Peel Commission (7 Aug. 1936). In the course of 1936 Arab work and trade were virtually at a standstill, and Arab shops were closed. An Arab 'Higher Committee' was formed which became a kind of *imperium in imperio*, and by June of that year the strike hardened throughout the country. Violence and sabotage increased. Roads were barricaded and trains derailed. Armed bands appeared in the hills, including volunteers from Syria and Iraq. Military reinforcements came from Malta and Egypt for the defence of key-points. By Aug. these bands were strengthened in numbers and arms and were joined by trained guerrilla leaders from outside P. In Sept. extensive

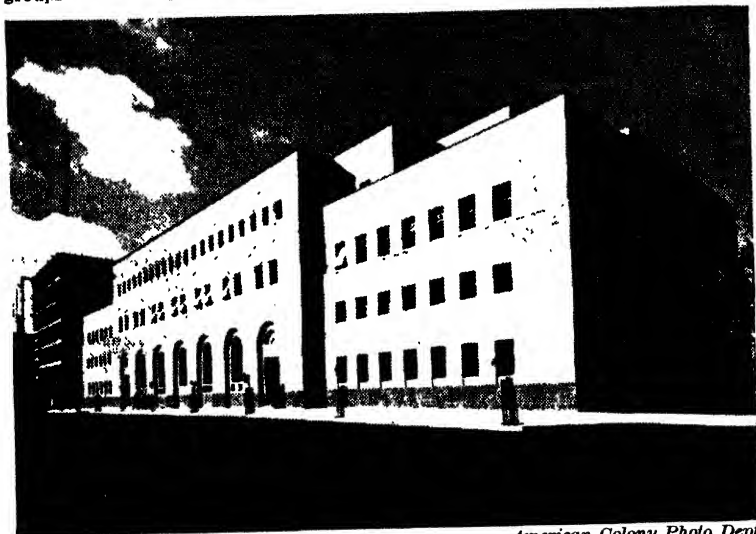
military operations were set on foot by the Brit. Gov. with a view to rounding up the bands, and over 20,000 Brit. troops were now in P. and martial law was authorised. Then came appeals from the Arab kings of Saudi Arabia, Transjordan, and Iraq to the Arab Higher Committee and the disturbances as an organised national movement ceased. It was then that the Peel Commission went out to P. The main recommendation of this commission, which reported in July 1937, was the partition of P., an independent Jewish state to be formed out of the predominantly Jewish-settled dists. along the coast and in the N., while the rest of P. was to become an independent Arab state. Jerusalem and Haifa were to remain under Brit. administration, and the Arabs were to get a corridor to the sea near Jaffa. The scheme was rejected by both Arabs and Jews and received such severe criticism in the House of Commons that it was in effect put back for further consideration, despite the fact that its major recommendation had already been accepted by the gov. Another commission, known as the Palestine Partition Commission, went out soon afterwards, and on their report against the practicability of partition, the Brit. Gov. came to the conclusion that the political, administrative, and financial difficulties involved in the Peel Commission's proposal to create independent states were so great that that solution of the problem was impracticable and it was dropped. Then came the Palestine Conference in London (Feb.-Mar. 1939); but as the Jewish and Arab delegations would neither meet nor agree on any compromise, the Brit. Gov. issued its own statement of policy in a White Paper pub. in May 1939. This document, which was to govern British policy in P. to the end of the Mandate, severely restricted Jewish immigration and land purchase, and envisaged the creation of an 'independent Palestinian state.' But further discussion of policy was cut short by the outbreak of the Second World War, during which Arabs and, especially, Jews seemed to lay aside their grievances in their willingness to support Britain in the fight. During the war P. was an important centre of British power and the base for the attack on the Vichy French in Syria and Lebanon in 1941.

*The End of Mandatory Rule.* During the war, some 6,000,000 Jews had been massacred by Hitler, and the end of the war found numerous refugees and the survivors of concentration camps anxious to immigrate to P. The White Paper regulations, however, forbade any extensive immigration. This inflamed Jewish sentiment in P. The change of gov. in Great Britain in 1945, when the Labour Party took office, had aroused hopes among the Jews, in view of the previous opposition of that Party to the White Paper and the public statements of its leaders. These hopes were soon disappointed when it was seen that British policy in P. was not to be changed. The Arabs were heartened by these developments, as well as by the growing

importance of the Arab states in the Middle East and the formation of the Arab League (q.v.).

In consequence, the Jews took over from the Arabs the rôle of rebellion against the British administration. The main Jewish military group was the *Haganah*. Originating as a defence force of the Jewish agricultural settlements against the pre-war Arab riots and rebellions, it now incorporated many of the members of the Jewish brigade which had served in Italy during the war. This body enjoyed the tacit support of official Jewish elements. Smaller, but more spectacular, groups were the *Irgun Ze'ei Leumi* and its

The gov. replied in various ways: by arresting the (moderate) Jewish leaders, by deporting illegal immigrants to Cyprus (and in one case to Germany), and by putting forward the 'Morrison Plan' for the future of P., a scheme for dividing the country into provinces or cantons which was unanimously rejected by Arabs and Jews alike. In Sept. a conference was held in London between the Brit. Gov. and representatives of the Arab states, but nothing useful emerged. Finally, despairing of any other solution, the gov. announced on 15 Feb. 1947 that it would submit the P. problem to the United Nations.



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offshoot *Lechi* (Stern group), specialising in bombing attacks and assassination. They were frowned upon by the Jewish leaders, but received much popular support.

U.S. pressure on the Brit. Gov. enforced the setting-up of an Anglo-American committee, which, in 1946, declared against the White Paper, urging the immediate admission of 100,000 Jews into Palestine. At the same time, the committee pronounced against the setting-up of either a Jewish or an Arab state in P. The Brit. Gov. did not accept the report, refusing to do so as long as the Jewish military forces remained in being. Meanwhile, the *Haganah* encouraged immigration into P. in defiance of the regulations and the *Irgun* increased the number and scope of its attacks. On 22 July 1946 the gov. offices in Jerusalem were blown up, with the loss of nearly a hundred lives.

In May 1947 a U.N. committee was formed and pursued inquiries in P. in the following months. The committee published its report in August, all the members agreeing that the Mandate should end and the country receive independence. The majority were in favour of the territorial division of P. into an Arab state and a Jewish state, with Jerusalem and its environs remaining a *corpus separatum* under U.N. trusteeship. The frontiers were planned partly in accordance with the distribution of the Arab and Jewish pop. and partly to secure the overriding economic unity of the country. The Jewish state, including the Negev (q.v.), would have had an area of 5500 sq. m. and the Arab State 4500 sq. m. Supported by the Jews, but opposed by the Arabs, the plan was adopted by the U.N. Assembly with the necessary two-thirds majority in Nov. 1947. The Brit. Gov.

agreed to terminate the Mandate on 15 May, 1948 and to evacuate its troops, numbering about 100,000, by 1. Aug.

The Arabs now reacted violently to these new proposals, and were soon joined by irregular forces from the neighbouring states. Civil war raged between Jews and Arabs, with occasional intervention by the British forces. The administration soon collapsed. Amidst the general chaos and confusion the Jewish Agency established control over the Jewish areas and perfected the organisation of *Haganah* as a national army. The Arabs were content to wait for the end of the Mandate and the entry of the regular armies of the neighbouring Arab states. At midnight on 14 May 1948 the High Commissioner left Palestine. Simultaneously, the Jewish state was proclaimed at Tel-Aviv, and recognised almost immediately by the U.S.A. and the U.S.S.R. Palestine had become a geographic expression. For the war of 1948, and subsequently, see ISRAEL.

**GOVERNMENT AND CONSTITUTION.** Under Turkish rule, part of P. was in the vilayet of Beirut and part in the independent sanjak of Jerusalem. After it was conquered in 1917-18 by Gen. Allenby, the country was placed under Brit. military administration until July 1920, when Sir Herbert Samuel was appointed High Commissioner and a civil administration was established. By the treaty of Lausanne (q.v.), 1923, Turkey renounced all right over P. The mandate given by the League of Nations to Great Britain came into force on 29 Sept. 1923, and under its terms Great Britain was responsible for carrying into effect the terms of the famous Balfour Declaration of 22 Nov. 1917. Under that declaration the Brit. Gov. projected the establishment of a national home for the Jewish people, it being understood that nothing should thereby be done to prejudice the civil and religious rights of existing non-Jewish communities in P., or the rights and political status enjoyed by Jews in any other country. A new constitution was promulgated on 1 Sept. 1922. It provided for the appointment of a High Commissioner and Commander-in-Chief, an Executive Council, and a Legislative Council. But no Legislative Council was ever elected owing to the persistent refusal of the Arabs to take part in the elections. To meet this emergency the High Commissioner, under an Order in Council of 1923, formed an Advisory Council composed of a number of the chief officials, to enact the necessary laws. Under the constitution English, Arabic, and Hebrew were the official languages of P. The country was divided into 6 dists., Jerusalem, Lydda, Haifa, Galilee and Acre, Samaria, and Gaza, administered by dist. commissioners. In 1927 regulations were made for the organisation of the Jewish pop. as a religious community, with autonomy for its internal affairs, religious, cultural, and communal. This community had a Chief Rabbinate, an Elected Assembly, and a General Council (*Va'ad Leumi*) elected by the Assembly to represent the community in its dealings

with the gov. The Brit. Gov. and the P. administration recognised the Jewish Agency as representing the Jewish people in all matters appertaining to the building up of the Jewish national home. The Muslim Supreme Council was constituted by the High Commissioner in 1921 to control Muslim affairs in P. This Council consisted of a president (Rais-ul-Ulema) and 4 elected members. It controlled the appointments of officers for the Sharia courts and for the *Waqfs* (Muslim religious endowments). There were (1948) 24 municipalities. Election to municipal councils were regulated by an ordinance of 1934. Much was done by the municipal corporations in town-planning, street construction, and drainage. In rural areas local affairs were administered by local councils. Law courts were either civil or religious, the former exercising jurisdiction in all save questions of personal status or charitable endowments, which were dealt with, amongst similar matters, by the Jewish, Muslim, and the sev. Christian courts. The Supreme Court consisted of a Brit. Chief Justice with 3 Brit. and 4 Palestinian judges. In 1937 the Ottoman code was replaced by a criminal code based on Eng. law.

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**Palestine, Operations in First World War.** Because of the evacuation of Gallipoli and the surrender of the Brit. force under Gen. Townshend at Kut (q.v.), Brit. prestige in the Near E. had declined. But the success of the O. in P. in 1917 was a material factor in restoring confidence. Brit. troops under Sir Archibald Murray began the offensive by advancing from N. Egypt and driving the Turks before them over the Sinai Desert. A halt then ensued in order to give time for the construction of a military railway from Kantara to Rafa on the SW. border of P., from which the advance was resumed northward along the coast. But at this point the advancing force was held up by the Turkish resistance at Gaza, the chief battle for the tn being on 26 Mar. 1917. This check, however, marked the limit of Turkish success; Gen. Murray was replaced by Gen. (later F.-M.) Allenby (q.v.) who had greatly distinguished himself on the W. front. The offensive was resumed in Oct., the moment being favourable because a considerable Turkish force was occupied, E. of the Dead Sea, against the Arabs of the Hedjaz. Allenby took Beersheba in a surprise attack and then fought the second battle of Gaza on 6 Dec., the tn falling on the following day. This success heralded the beginning of his victorious advance through P., for Jerusalem was captured after the battles fought 7-9 Dec. 1917, 3 weeks after the Brit. had taken Jaffa, the latter tn falling after the ousting of the Jaffa-Jerusalem railway at Ludd. Jerusalem was encircled from nearly all quarters, all the Turkish outer positions being taken by storm, and the city itself was surrendered without standing a siege. The following year Jericho was taken in the fighting of 19-21 Feb., and thereafter followed a long halt in the operations, the Brit. hold on the country being in the meantime consolidated. The culminating battle in the P. operations was that of Megiddo (19-25 Sept. 1918), which followed a brilliant outflanking operation by the cavalry under Sir Philip Chetwode. Allenby's P. campaign is a tale of almost uninterrupted success and of efficient management, and much of the success was due to his magnetic personality. He was especially successful in welding together the very various components of his force, regulars, yeomanry, and New Army, the mounted troops of Australasia, and the Indian contingent, a great part

of which contained elements previously untested in war. The Arab effort, too, under T. E. Lawrence (q.v.), was of considerable value, and it was not the least of Allenby's achievements that he should have made the best of such difficult allies. The P. operations were valuable in diverting the strength of the Turks, and to some extent even of the Germans, from more vulnerable points of the allied fronts, and still more in their moral effect. The campaign has a special interest in the brilliant and, no doubt, spectacular work of the cavalry, an effort which marked the last great campaign of mounted troops in modern warfare. See T. E. Lawrence, *Revolt in the Desert*, 1927, and Sir G. McMunn and Sir C. Falls, *Military Operations, Egypt and Palestine, 1917-1919*, 1928.

**Palestine Exploration Fund**, founded in 1865. Its first important work was a complete and accurate survey, both topographical and geographical, of the country, and it has organised many archaeological excavations mainly concerned with biblical hist., full reports of their findings appearing in the Jour. of the Fund pub. twice yearly.

**Palestrina, Giovanni Pierluigi da** (1525-94), It. composer, b. in the town of Palestrina (whence his name, 'of P.'), became a boy chorister in the cathedral there, but at the age of 9 was taken to Rome, where he entered the choir-school of S. Maria Maggiore. He probably studied under Firmin Le Bel there. In 1544 he became choirmaster at Palestrina cathedral, but in 1551 he was summoned to Rome as *maestro di cappella* of the Julian Choir at St Peter's, and in 1555 he was transferred to a similar post at S. Giovanni in Laterano. He had by this time established himself as a composer of church music and madrigals and dedicated the *Missae Papae Marcelli* to Pope Marcellus II. He resigned his post at S. Giovanni in 1560 and became *maestro* at S. Maria Maggiore the next year, and director of the Roman Seminary in 1565. Offers from the courts of Vienna and Mantua failed to result in appointments, and he remained in Rome until his death. He was twice married, in 1547 and 1581. He d. in Rome on 2 Feb. 1594. Nearly 100 masses and nearly 300 motets of his are preserved, also a great deal of other church music, spiritual and secular madrigals, etc. P. represents the finest achievement of his period in the domain of sacred polyphonic music in Italy, the Flem., Sp., and Eng. schools being equally well represented by Lassus, Victoria, and Byrd. See life by H. Coates, 1938, and K. Jeppesen, *The Style of P.*, 1950.

**Palestrina** (anc. Praeneste), It. tn, in Lazio (q.v.), standing on a spur of the Apennines, 1476 ft above sea-level, 22 m. ESE. of Rome (q.v.). It commands a magnificent view of Rome and the Alban Hills (q.v.). In 499 BC the anc. city made an alliance with Rome, separating from the Lat. League, to which it had previously belonged, but during the Lat. war (340-338) it fought against Rome and



lost part of its ter. (see ROMAN HISTORY). Down to the time of the Social war it remained an allied city, and it then received the Rom. franchise (about 90 bc). During the civil wars of Sulla (q.v.) the tn was blockaded, and after it fell a military colony settled there. Sulla removed the city from the hillside to the lower ground at Madonna dell' Aquila and enlarged the famous temple of Fortune on the site of the anct city, making it the largest in all Italy. It was built on 5 terraces, and contained the famous mosaic with scenes from the Nile now in the Palazzo Barberini. It was also famed for its oracle, which was consulted down to the time of Constantine, who had the temple closed. The city became a favourite resort of the Romans, and Hadrian and Marcus Aurelius had villas there. In 1297 the Colonna (q.v.) family owned the city, and during a revolt against the Pope it was taken and destroyed. It was rebuilt, but in 1437 the new city shared the same fate. Stefano Colonna rebuilt it in 1448 and fortified it, and it remained in the possession of the family until purchased by the Barberini (q.v.) family in 1630. Only a few ruins of the anct city remain; but excavations have brought many interesting relics to light, among them an anct calendar which had been used in the rebuilding, and the famous Flicroni casket found in 1738 and preserved in the Kircherian Museum in Rome. Here was found the earliest Lat. inscription. P. has a cathedral, and a ruined castle of the Colonna, as well as the Palazzo Barberini. There was some damage during the Second World War. Pop. (tn) 8400; (com.) 9200.

**Paley, William** (1743-1805), divine, b. Peterborough; educ. at Christ's College, Cambridge, and was senior wrangler in 1763. He was ordained, 1767, and, after holding sev. livings, was appointed prebendary (1780) and then archdeacon (1782) of Carlisle. He pub. *The Principles of Moral and Political Philosophy*, 1785; *Horae Paulinae*, 1790; *A View of the Evidences of Christianity*, 1794; and many other works. The *Evidences of Christianity* brought him into great prominence as a theological writer and was long accepted as a standard work. See life by G. W. Meadley, 1809; also L. Wainwright, *A Vindication of Dr Paley's Theory of Morals*, 1830.

**Palgrave, Sir Francis** (1788-1861), historian, b. London of Jewish parentage, converted to Christianity in 1823. Called to the Bar in 1827, from 1838 till his death he was deputy keeper of the records, in which capacity he arranged a great mass of hitherto inaccessible documents and ed. many of them for the Record Commission. Among the most important of these are *Parliamentary Writs*, 1827-84. Among his works are *History of England* (only vol. i pub.), *Anglo-Saxon Period*, 1831; *The Rise and Progress of the British Commonwealth*, 1832; *The History of Normandy and of England* (4 vols.), 1851-64. His works were of great contemporary value in throwing new light upon the hist. and condition of medieval

England, though they have since been largely superseded.

**Palgrave, Francis Turner** (1824-87), poet and anthologist, b. Great Yarmouth, Norfolk, son of Sir Francis P. (q.v.). Educ. at Charterhouse and Balliol College, Oxford, in 1846 he became private secretary to Gladstone, and 2 years later entered the Education Office, in which he rose to be assistant-secretary. He retired from the service at the age of 60. He was prof. of poetry at Oxford from 1885 until 1895. He was the author of sev. vols. of poetry and essays, but he is best remembered for his anthology, *The Golden Treasury of Songs and Lyrics*, 1861. This is still regarded as one of the best, if not the best, of the works of this kind, and to its compilation P. brought a wide knowledge of literature and a fine judgment. See life by G. F. Palgrave, 1899.

**Palgrave, Sir Robert Harry Inglis** (1827-1919), economist, b. Westminster, son of Sir Francis P. He ed. the *Economist* newspaper 1877-83, was knighted 1909, and received the hon. freedom of Great Yarmouth 1910. His pub. include *The Local Taxation of Great Britain and Ireland*, 1871; *Notes on Banking*, 1873; *Analysis of the Transactions of the Bank of England, 1844-72*, 1874; and *Enquiry into the Economic Condition of the Country*, 1904. He ed. the *Dictionary of Political Economy*, 1894-1906—*Appendix*, 1908.

**Pali.** The term P. means actually the 'text,' the text *par excellence*, the text of the Hinayana Buddhist scriptures, but it indicates also the language in which the sacred scriptures of Buddhism are recorded, and the script in which these are written. The P. scriptures contain a literature about double the size of the Bible, but if its repetitions were excised it would be somewhat smaller than the Bible. It consists of 3 Pitakas (called also Tripitaka), baskets, or collections. They are supposed to be the teachings of the Buddha, which were being handed down orally; they were committed to writing probably at the end of the 1st cent. bc (traditionally in 80 bc). The first Pitaka is the Vinaya (rules), dealing with discipline, but including the Mahavagga, a hist. of the founding of the order of Buddhism, and the exposition of monastic rules. The second is the Sutta (*Sūtra*) Pitaka, the doctrine or collection of teachings. It consists mainly of dialogues between the Buddha and various interlocutors, and it contains books of meditation and devotion, sayings by the Master, poems, fairy tales and fables, stories about Buddhist saints, and so on. The third collection, the *Abhidhamma* (analytical exercises), or dogmatic statement of the psychologic and philosophic discriminations, contains speculations and discussions on various subjects. There are some other treatises in the P. literature. The most important historical work written in this language is the *Mahāvamsa*; other P. works are the *Dhammapada* and the *Sutta-nipāṭa*, lofty and artistic ethical and religious verse; the highly literary Jātaka book of 547 stories of Buddha's prior incarnations in

various animal and human forms; the beautiful poetic compositions of the *Thera-gāthā* and *Theri-gāthā*, or 'Songs of the Monks' and 'Songs of the Nuns'; the *Mūlinda-pāṭha*, or dialogues of the Buddhist monk Nāgaena with the Gk king Menander, etc.

The language P. should be termed *palibhāṣā* or *tantibhāṣā* rather than P. It is an anct Prakrit, i.e. a 'natural uncultivated' local Middle Indian, dialect, probably originating in NW. India. The great Gautama Sakyamuni Buddha (see BUDDHA), anxious to make his spiritual teachings accessible to the common people, refused to confine them to Sanskrit (q.v.), the language of the small privileged class. His teachings thus became a potent cause of the development of the language of the people. It is uncertain, however, which of the local dialects became the P. language. According to some scholars, it was a prototype of Māgadhī, according to others it should be traced to anct W. Hindi. It is also uncertain whether the oldest works of Buddhism were actually written in what is now known as P. Two main causes made P. the great literary vehicle which it was and still is: (1) a political cause—the estab. in the 7th cent. BC of the great state of Kosala and Māgadhā in N. India, leading to a new standard speech, P., which was adopted at the court of Kosala, at Sāvattthi; and (2) a cultural-religious cause—the adoption by the Buddha (q.v.), himself apparently a native of Kosala, of P. for his teaching and propaganda vehicle. P. is nowadays used in Ceylon, Siam, and Burma as the liturgical language of Buddhism, although it had to give way to native tongues, in which the later Buddhist literature was composed.

The P. script developed from the archaic Brāhmī, and in the last centuries BC became the writing of the Buddhist scriptures; it was carried by the Buddhists to Ceylon, where it gave rise to the early Sinhalese writing. The cultural expansion of India into Burma, Cambodia, Cochīn China, and Siam was also mainly due to Buddhism. The scripts of the Buddhist monks became the vehicle of culture and outward organisation: thus Buddhism played in SE. Asia a part similar to that of Rom. Christianity in W. and Central Europe in the Middle Ages. P. Buddhism, i.e. the particular form of Buddhism based on the sacred P. books, was brought over from Ceylon in the 11th–12th cent. AD. In Burma the 'square' P. script developed into a capricious, highly calligraphic character, generally employed for writing the religious Buddhist books. The letters are painted with a broad brush (generally in dark-brown lacquer, and sometimes on a plate of gilded metal) and are correspondingly very thick. The Buddhist Burmese script was adopted by various peoples (the Karens, the Taungtha, the Yao, and others), but the Siamese and the various Shan scripts, the Javanese, and other Indonesian scripts, and so forth, which are still considered by some scholars as

belonging to the P. branch, may be better termed the Further-Indian branch of scripts, because they do not descend from the P. branch, but from another script of Indian origin.

Palikao, Comte de, see COUSIN-MONTAUBAN.

Palimpsest, see ALDEBARAN.

Palimpsest (Gk *palimpsestos*, scraped again), name given to a MS. on parchment, from which the original writing has been erased or washed out, and another text written over it. This practice by the Greeks and Romans was due to the scarcity and high cost of parchment, and is mentioned by Cicero, *Ad Fam.* vii, Plutarch, and other classical writers. Cicero banter his friend the lawyer Trebatius upon his economy in using P. in his correspondence, and expresses the hope that they are his own consultations and not Cicero's letters that he erases. Actually no very anct P.s have come down to us. P.s became most common between the 7th and 9th cents., but continued even down to the 16th. The old writing was scraped off with a razor or with pumice, and a mixture of cheese, milk, and lime was used to soften the vellum. However, the ink of the old writing had penetrated so deeply into the parchment that even most severe scraping could not remove all traces of the text. If the MS. is soaked in certain chemicals, the blue or red outlines of the old writing come again to the surface. Unfortunately after this treatment—primarily acid obtained from oak gall was used for restoring the P.—the MS. becomes so dim that it is impossible to read it. More recently, in place of tannic acid, other substances have been used, which bring out the old writing for a short time. While the text is thus visible, photographs are taken, and then the acids are washed out. Nowadays photographs of an old writing can be taken without any chemical treatment, by using ultra-violet rays or fluorescence. Many valuable MSS. which were lost have thus been restored. There are even P.s in which there appear 3 successive writings. Sometimes the P.s are bilingual, the old writing being Greek and the new writing being Latin, or Syriac and Arabic, or Hebrew and Latin, and so forth. Many P.s are written in capitals or uncials, in Greek or Latin. A Sinaitic Syriac P. turned out to be one of the earliest trans. of the N.T. The idea of using P. MSS. for the discovery of fragments of lost works was first taken up about the 18th cent. Dr Bruno ed. his fragments of Livy in 1773. Niebuhr's ed. appeared in 1820. Cicero's *Republic* and the *Institutiones* of Gaius were thus recovered. Mai pub. the *Codex Ambrosianus* of Plautus, 1814–15. Tischendorf discovered biblical P.s, including the *Codex Ephraemi*, 1843–5. See E. Chatelet, *Les Palimpsestes latins*, 1907.

Palindromes (Gk *palin*, again, and *dromos*, a course) is a sentence or phrase that reads the same either backwards or forwards, as, for example, the Latin verse, *Roma tibi subito motibus ibit amor*. An example in Eng. is, 'Able was I ere I

saw Elba,' supposed to have been said by Napoleon when asked whether he could have invaded England. 'Dog a devil deified, deified lived a god' is said to be the longest P. in Eng. The 'Sator-Arepe formula':

SATOR  
AREPE  
TENET  
OPERA  
ROTAS

('The sower of the acre holds the wheels at work') is, besides being a P., a quadrate, i.e. it can be read as a square. This magician's formula can be traced back to the 4th cent. AD, and appears to have originated in Asia Minor. The term P. is also used of a single word such as 'ere.'

**Palinurus**, helmsman of Aeneas, who was drowned off the W. coast of Italy (Lucania) on the way from Troy, having fallen overboard while asleep. **Palinuro Punta** (or Spartimento), above the Gulf of Policastro, was called after him. See *Virgil, Aen. vi. 337*; *Strabo, vi.*

**Pallsander Wood**, see *ROSEWOOD*.

**Palissy**, Bernard (c. 1510-c. 1590), Fr. potter and enameller, b. near Agen. His reputation is largely based on literary sources, beginning with his own fantastic writings, according to which he laboured for years in direst poverty to discover how to make fine enamels. In 1548 the Constable de Montmorency ordered several works from P. During the next 15 years P. succeeded in producing that distinctive ware called by his name, earthenware moulded in high relief with water creatures, shells, fishes, lizards, leaves, and other natural objects, and covered with coloured lead-glazes of wonderful harmonies. In 1566 Catherine de' Medici, the Queen Mother of France, summoned him to Paris to make a grotto, some fragments of which, found in 1878, are in the Louvre. Although saved from the Massacre of St Bartholomew's Day by Catherine de' Medici, he retired to Sedan until 1575, when he returned to Paris, where he lectured on natural hist. until 1584. With the renewed persecution in 1586, P. was imprisoned in the Bastille, where he d. about 4 years later. *Anatole France* pub. his *Oeuvres complètes*, 1880. See *lives* by H. Morley, 1852; F. de Lasteyrie, 1865; E. Dupuy, 1902; A. B. Hanschmann, 1903; D. Leroux, 1928; see also M. J. Ballot (*Musée du Louvre: Documents d'art*), *Bernard Palissy et les fabriques du XVI<sup>e</sup> siècle*, Paris, 1924.

**Palitana**, state and tn of Kathiawar peninsula, Bombay, India, 78 m. NE. of Diu, now merged in Saurashtra State. The Satrunjaya Hill above the city (W.) is the most sacred of the hills of the Jains (c. 1977 ft.). It is covered with temples and shrines, some dating from the 11th cent. The larger ones are in 'tunks' or separate enclosures. Horse-breeding is largely carried on. See J. Burgess, *Notes of a Visit to Satrunjaya Hill*, 1869.

**Pallurus**, genus of deciduous flowering shrubs (family Rhamnaceae), with slender branches bearing spiny stipules and

clusters of small green and yellow flowers, followed by dry, hemispherical fruits. *P. spina-Christi* is Christ's thorn (q.v.).

**Palk's Bay and Strait**, gulf and channel of the Indian Ocean, between India and N. Ceylon, N. of the shoals called 'Adam's Bridge.' The Dutch named it after Governor Palk. At the narrowest part it measures 40 m. across.

**Pall**: 1. Stiffened square of linen used to cover the Eucharistic chalice, partly for reverence, partly to keep out flies.

2. Rich cloth used to cover a coffin while it stands in the church or is being borne to burial.

3. The pallium (q.v.).

**Pall-mall, Pell-mell**, or *Mell*, see *MALL*, *THE*.

'**Pall Mall Gazette**,' penny daily evening paper founded in 1865. The first proprietor was Thackeray's publisher, and the editor was Thackeray's assistant on the *Cornhill Magazine*, facts which, taken with the early style of the paper, have often suggested that it was based upon Thackeray's journal (also called the *P. M. G.*) written by 'gentlemen for gentlemen.' It took an independent line in politics down to 1880, when it became, under John (later Lord) Morley's editorship, a Radical paper. Later it became as strongly Conservative as it had been Radical. In 1923 it was incorporated in the *Evening Standard* (q.v.).

**Palladian**, see *PALLADIO*, *ANDREA*.

**Palladio**, Andrea (1508-80), It. architect, b. Vicenza. He studied in his native city and at Rome. He was one of the greatest It. architects of the late Renaissance, and the style which he used has received the name of Palladian. It was an attempt to revive the severity and dignity of Roman architecture, and was derived from Vitruvius and from a study of the Roman monuments that remained. Its best exponent in England was Inigo Jones. P. greatly influenced the architecture of his day by his work, *I quattro libri dell' Architettura*, 1570, which was immediately trans. into most European languages. His chief buildings were the Palazzo della Ragione and numerous private palaces at Vicenza; sev. villas in the neighbourhood; and the churches of S. Giorgio and Il Redentore at Venice. See biography by B. F. Fletcher, 1902.

**Palladium**, an anct wooden image of Pallas (a surname of Athena), upon the preservation of which in its sanctuary the safety and welfare of the State depended. It had fallen from heaven as a gift from Zeus to the founder of Ilum, and was guarded in the citadel of Troy. Odysseus and Diomedes stole it during the Trojan war, thus securing victory for the Greeks. It was brought by Aeneas to Italy and kept in Vesta's temple at Rome. A P. has come to mean a 'protecting talisman.'

**Palladium**, chemical element, symbol Pd, atomic number 46, atomic weight 106.7; one of the 'platinum metals' found in the platinum ore which occurs in small grains and rare nuggets in alluvial deposits and riv. sand principally in Brazil, California, and the Urals. It is a lustrous white metal (melting-point about 1500° C.

and sp. gr. 11.8) which is not acted on by the air at ordinary temps. P. forms the exception in the platinum group of metals by dissolving in hot nitric acid. The oxides PdO, Pd<sub>2</sub>O, and Pd<sub>2</sub>O<sub>3</sub> are known, and the metal forms palladous salts corresponding to the monoxide as well as a palladic chloride, PdCl<sub>2</sub>. The metal has the special property of occluding large volumes of hydrogen to form a substance of metallic appearance which is not a true compound, though it approximates to the composition PdH. Absorption takes place most rapidly at 100° C., and with finely divided metal, about 900 vols. of hydrogen being absorbed by 1 vol. of metal. P. is used in dentistry, jewellery, scientific instruments, aeroplanes, etc.

**Palladius**, **Rutilius Taurus Aemilianus**, Rom. author of the 4th cent. AD, who lived about the time of Valentinian or Theodosius. His *Opus Agriculturae* was mainly compiled from Columella and earlier writers. A Middle English verse trans. from an Eng. MS. (c. 1420) was pub. for the Early English Text Society under the title *Palladius on Husbandrie*. See J. C. Schmitt's Ger. ed., 1898, and J. G. Schneider, *Scriptores Rei Rusticae*, iii, 1795.

**Pallantia**, see **PALENCIA**.

**Pallanza**, It. tn, in Piedmont (q.v.), on the central basin of Lake Maggiore (q.v.). It commands a fine view of the Alps and is a popular tourist resort. Pop. 5500.

**Pallas**: 1. Appellation of the Gk goddess Athena (q.v.), perhaps meaning virgin.

2. Freedman of and secretary *a rationibus* to the emperor Claudius (q.v.). It was at his instigation that Claudius married Agrippina the younger, adopted her son (the future emperor Nero), and was afterwards murdered. See Suetonius, *Claudius*; Tacitus, *Annals*, xiii; Juvenal, i. 107.

**Pallas**, Peter Simon (1741-1811), Ger. traveller and naturalist, b. Berlin. He studied medicine and natural hist. at the univ. of Berlin, Göttingen, and Leyden. In 1766 P. pub. *Elenchus Zeyphorum* and *Miscellanea Zoologica*. With these works he gained a high reputation, and in 1768 he was appointed naturalist to a scientific expedition bound for Siberia, there to observe the transit of Venus. P. returned to St Petersburg in 1774 with extraordinary specimens in natural hist., which formed the nucleus of the museum of the Academy of St Petersburg. His other works include *Reisen durch verschiedene Provinzen des russischen Reichs* (3 vols., 1771-6; supplement, 1779-1801); *Sammlungen historischer Nachrichten über die mongolischen Völkerschaften* (2 vols.), 1776-1802; *Flora Rossica*; and *Icones insectorum, praesertim Rossiae Siberiaeque peculiarium*, 1781-1806.

**Pallas**, hamlet of Longford co., Rep. of I., 2 m. SE. of Ballymahon. Oliver Goldsmith was b. here (1728).

**Pallas**, second asteroid (q.v.) in order of discovery (Ceres being the first) and farthest from the sun, revolving between

the orbits of Mars and Jupiter. It was discovered by Olbers at Bremen (1802). Its magnitude remains uncertain, while its period of revolution is about 4.61 years.

**Pallavicino**, **Pietro Sforza** (1607-67?), It. historian and cardinal, son of Alessandro P. of Parma, b. Rome. P. took priest's orders and held important eccles. appointments during the pontificate of Urban VIII. He entered the Society of Jesus in 1637, and was created cardinal by Pope Alexander VII in 1657. P. was the author of many fine works, but the best known is his *Istoria del Concilio de Trento*, 1656-7, intended as a reply to the still more celebrated work of Paul Sarpi. His collected works were pub. 1844-8.

**Pallise, La**, see **ROCHELLE, LA**.

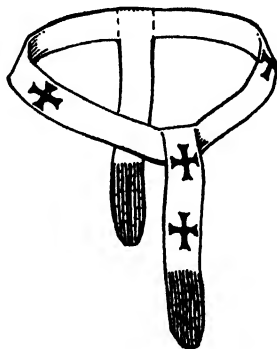
**Palliser**, Sir Hugh (1723-96), adm., son of Hugh P., an army officer, b. Yorkshire. In 1759, in his ship *Shrewsbury*, in which he had fought under Anson off Ushant and captured many prizes, he took part in the operations in the St Lawrence leading up to the capture of Quebec. In 1764 he was governor and commander-in-chief of Newfoundland. In 1778 he was promoted to be vice-adm. of the blue. After the action off Ushant in July 1778, in which the Fr. fleet escaped, a court-martial was held on Keppel (q.v.). P.'s superior officer, whose charges of neglect of duty against P. were pronounced malicious and false. P., whose supporters, adversaries of Keppel, had instigated the inquiry, consequently resigned and applied for a court-martial on himself, the result being that he was censured for his conduct in the action. It seems probable that a fair and independent court would have reached a very different conclusion. P. was a brave and capable officer, though his conduct in the action remains a mystery, the more difficult to solve because his character was differently estimated by the factions of the day. In the year after the court-martial he was appointed governor of Greenwich Hospital, and he became an adm. in 1787. See Southey's *Life of Nelson*, 1813.

**Palliser**, John (1817-87), Canadian geographer and explorer, b. Ireland, brother of Sir Wm P. (q.v.). He travelled over N. America, in the then uncharted regions of the far W., between 1847 and 1861. He made a topographical delimitation of the boundary between Canada and the U.S.A. from Lake Superior to the Pacific coast.

**Palliser**, Sir William (1830-82), soldier, b. Dublin, entered the Army as a cavalry officer. He invented the method of chilled shot that bears his name and the method of converting smooth bore into rifled guns (1862-3).

**Pallium**, narrow circular strip of cloth, about 2 in. wide, with two pendants about 12 in. in length which hang down, one over the breast, the other at the back, worn by the Pope and by archbishops about the neck, breast, and shoulders. The pendant strips are weighted with small pieces of lead enclosed in black silk. The P. is made of white wool taken from 2 lambs provided by the Lateran canons of St John and blessed by the Pope on the

feast of St Agnes. The Pope may wear the P. on all occasions, but the times of its use by archbishops are strictly regulated. The P. is granted only by the Pope, and each newly consecrated metropolitan must apply to him for it within a year after consecration. The P. symbolises the supreme pastoral power. It came into use in the 5th cent., being simply the old 'scarf of office' worn by the emperor and consuls and granted to other officials during the 4th cent. This scarf also developed into the stole (q.v.). Originally pallia, lay and clerical alike, were of coloured silk. Celestine I (AD 425) protested violently against its adoption. See G. Dix, *The Shape of the Liturgy*, 1945.



**Palm**, common name of members of the *Palmales*, a monocotyledonous family of woody perennials, containing about 1100 species, natives of the tropics and subtropics, with the exception of *Chamaerops humilis*, a pretty, small fan-palm, native to the Mediterranean, and hardy enough for mild districts in the SW. of Britain. The P.s grow usually with unbranched stems and by the terminal bud, except in *Hyphaene* (q.v.), forming a crown of leaves at the apex, which are usually fan-shaped, and radiate- or pinnate-veined, varying in size according to species, from inches long in *Reinhardtia* to several feet in *Manicaria*, and having a thick, glossy cuticle which restricts transpiration and moisture loss under hot sun. The inflorescence is usually large and branched, usually axillary, sometimes terminal, with flowers borne on a spadix, and enclosed in a spathe of several leaves, emerging when the flowers are ready. Each flower is sessile, with 3 sepals and 3 petals, which are alike and form a greenish or yellowish perianth, with 6 stamens, a pistil, and usually 3 carpels. The fruit varies greatly in size and structure, and may be a drupe or a berry, the seeds having a large endosperm. Many P.s are monocotyledons, others dioecious. As monocotyledons P.s have no tap-root, and in some species the cotyledon is lengthened

downward considerably to give anchorage and stability to a tall stem.

Economically the P.s are important, and have many uses. They provide building materials, the timber of *Sabal palmetto* being valued commercially for its durability; food products include the coconut (*Cocos nucifera*), date (*Phoenix dactylifera*), P. honey (*Jubaea spectabilis*), P. sugar and P. wine from various P.s, and sago and similar foods obtained from the pith of *Arenga pinnata*, *Caryota*, and other P.s. Other products include P. oil from the fruits of *Elaeis guineensis*, carnauba wax from the leaves of *Copernicia cerifera*, vegetable ivory from the seeds of *Phytelephas macrocarpa*, and betel nuts from *Areca catechu*. The leaves of many P.s are used for thatching and native building materials; those of the Palmyra P. (*Borassus flabellifer*) for paper and records; others for straw-hat making; and the leaf mid-ribs of *Metroxylon* may be split for use as flooring or panel boards. Rattan canes are provided by *Calamus rotang* and *C. tenuis*, and Malacca canes by *C. scipionum*.

Many P.s are grown for their decorative foliage indoors or in greenhouses in Britain, and they may usually be propagated from seeds, under glass, with bottom heat, though germination is slow. They are the better for restricted root room, and seedlings should be potted when 2- or 3-leaved. Spring is sowing and re-potting time, and given proper watering, with occasional sponging of the leaves, and shade from hot sun, the plants are quite long-lived, tolerating winter temps. down to 50° F. Important genera include *Acanthophoenix*, *Alphanea*, *Areca*, *Arenga*, *Borassus*, *Calamus*, *Caryota*, *Chamaerops*, *Cocos*, *Copernicia*, *Corypha*, *Elaeis*, *Howea*, *Jubaea*, *Livistonia*, *Manicaria*, *Mauritia*, *Metroxylon*, *Neanthe*, *Phoenix*, *Raphia*, *Reinhardtia*, *Rhapis*, *Sabal*, *Syagrus*, *Trachycarpus*, *Versaffeltia*, *Wallichia*, *Washingtonia*, *Welfia*, and *Zalacca*.

**Palm Beach**, tn, P.B. co., Florida, U.S.A., situated on a narrow piece of land between Lake Worth and the Atlantic Ocean, 65 m. N. of Miami. It is a fashionable resort. Its nearest railway station is West P. B., on the opposite side of Lake Worth and connected with it by a bridge and ferry. Pop. 3886.

**Palm Beach, West**, see **WEST**.

**Palm Fruit**, from numerous varieties of the oil palm *Elaeis guineensis*, native to the tropical regions of W. Africa, where it is confined mainly to a 300-m.-wide coastal belt extending from the Gambia to Angola, and also cultivated on plantations on a very wide scale in Indonesia and Malaya. In W. Africa the trees grow principally in the wild state, but an increasing number is being cultivated there on plantations. The uncultivated palm starts to fruit when 15-17 years old, by which time it has attained a height at which it must be climbed in order to cut down the large bunches or 'heads' of fruit from amongst the fronds at the top, whereas the cultivated dwarf palm starts to fruit 6 years after planting, and the

fruit may be harvested from ground level until the tree is about 12 years old. Each tree bears about 5 bunches of fruit each year at maturity, each bunch weighing 35-40 lb. and containing up to 1000 P. F., which are oval and pointed at the apex and about 1½ in. in length by 1 in. in diameter. The mature fruit may be yellow, orange, reddish brown, or nearly black, depending upon the variety, and consists of an outer pulpy, fibrous layer (pericarp) enclosing a nut, which contains the brown to black palm kernel. P. F. produces 2 different varieties of oil, palm oil from the pericarp and palm-kernel oil from the seed kernel. The relative proportions of palm and palm-kernel oil in a fruit vary considerably, as the fruits of the different varieties differ much in thickness of pericarp and shell, and size of kernel. The main varieties of the palm *E. guineensis* are: *Macrocarpa*, which yields a fruit with a relatively large nut and correspondingly thin pericarp; *Dura*, which produces a fruit with a thicker pericarp and thick shell but smaller proportion of kernel; and *Tenera*, which produces a fruit with a much thicker pericarp and small thin-shelled kernel. The variety *Macrocarpa* is found widely distributed in W. Africa, and is always self-sown. *Dura* is the most common in natural palmeries, and a type of *Dura*, known as *Deli*, has been extensively cultivated on plantations in SE. Asia, chiefly for palm oil. *Tenera*, also common to W. Africa, is particularly attractive for plantations in W. Africa and SE. Asia, and has been chosen for cultivation for palm-oil production, the kernels being a by-product. The pericarp and palm kernel each contain up to 50 per cent of oil.

**Palm-kernel Oil** is obtained from the hard kernel of the oil-palm fruit, and is very similar in almost every respect to coconut oil. By far the bulk of world production of palm kernels is exported to W. European countries, chiefly to the U.K., for processing by high-pressure 'expellers' (continuous-screw presses) and, to a small extent, by low-pressure expellers followed by solvent extraction, but a small quantity has been crushed in recent years in the producing regions by modern mills erected and operated by W. European companies. None is crushed by the W. African natives, whose main purpose is the comparatively easy expression of palm oil from the pericarp of the palm fruit. Nigeria has been for many years the prin. source of palm kernels, and in 1954 exported some 57 per cent of the world total export of 820,000 tons; W. Africa as a whole exported about 750,000 tons, while Indonesia and Malaya together exported 56,000 tons. The oil expressed or solvent extracted from the white 'meat' of the kernel is screened and filtered to remove all traces of fine meal ('foots'), and may then be transferred to the soap manufacturer as crude oil or, if required for edible purposes, is passed through a refining process for removal of all free fatty acids, colour, and those substances which give rise to flavour and odour.

Refined P.-k. O., which sets to a white fat when cooled below 26°C., is used in margarine manuf., or is 'hardened' by hydrogenation for use in confectionery, chocolate, synthetic cream, ice-cream, etc. It is also separated into 2 fractions, a hard stearine and liquid oleine, by hydraulic pressing, for the production of special fats for confectionery, etc. Main fatty acid components of the oil are: saturated—lauric (46-52 per cent), myristic (14-18 per cent), palmitic (6-9 per cent); and unsaturated—oleic (10-19 per cent). The expelled cake and solvent-extracted meal, containing about 6 per cent and 1 per cent of oil respectively, are used in animal compound feeding-stuffs. See PALM FRUIT and OILSEEDS, PROCESSING OF.

**Palm Oil**, fat extracted, by boiling and skimming, from the pulp of the fruit of various palms. It has a butter-like consistency, a dark orange colour, and, when fresh, a pleasant odour. It mixes with turpentine and ether, and melts at 27°C. Both P. O. and palm kernels are derived from the fruit of the oil-palm. A fibrous pericarp contains the oil and covers the shell, which is cracked to obtain the kernel of commerce. In W. Africa the edible pericarp oil is extracted by crude methods and the nuts are cracked by women and children. Kernels are not used by the Africans, but are exported to Europe for crushing. P. O. is employed largely in the manuf. of margarine and soap, and also candles and railway grease. Brit. W. Africa is the largest producer in the world and, except for a few European plantations, production is in the hands of Africans. Nigeria has exported as much as 210,000 tons annually, and the old name, 'Oil Rivs.', was once applied to the Niger delta because, in the early hist. of the country, P. O. and kernels were brought down the waterways for trading at the ports. In 1922 the W. African trade began to encounter keen competition from the Dutch E. Indies and Malaya, which exported an oil superior in quality and with a lower percentage of free fatty acid. The Nigerian Gov. has taken steps to improve the existing palm groves and to induce the natives to use hand-presses; but progress is slow because it is difficult to persuade the natives to give up old methods. In Ghana oil-palm products were the staple agric. export before the development of cacao. The oil-palm is also grown in Sierra Leone, and there is a large consumption of P. O. for food purposes; but the fruit of the indigenous palm of that colony yields relatively little oil, and breeding is confined to imported varieties. In Fr. Togoland the oil-palm is an important source of revenue, and in parts of the Belgian Congo the oil-palm has always been important in native economy as a source of food and other products, but large areas have been planted at different times and then abandoned. Progress in P. O. extraction methods in recent years has been such that

**Palm Sunday**, last Sunday in Lent, the Sunday before Easter (q.v.), obtains its name from Christ's triumphal entry into Jerusalem (Matt. xxi). In the Rom. Catholic Church and the oriental Churches an elaborate ceremonial, including a procession of palms, takes place on this day. Palms are also blessed and distributed to the faithful to be taken home. Some of these ceremonies have been revived in many Anglican parishes. In Wales, a vestige of the old ceremonies may perhaps be seen in the custom of decking graves with flowers on P. S.

**Palma**, Sp. tn, cap. of the Balearic Isles (q.v.), standing on a wide bay of the SW. coast of Majorca (q.v.). There is a vast, and very fine, Gothic cathedral, begun in 1230, and near to it is the Almudaina, a former royal palace, which dates from the 14th cent. Many fine mansions and a 14th-cent. Gothic bourse testify to P.'s ancient prosperity as one of the great Mediterranean ports. Other buildings of note include the 13th-cent. church of St Francis of Assisi, which contains the tomb of Raimon Lull (q.v.), and the circular royal castle of Bellver. A printing office in the tn, founded by Jaime Guasp in 1578, is still in operation. P. has a busy harbour, a trade in grain, wine, silk, and fruits, and manufs. of glass, textiles, shoes, and liqueurs. Pop. 143,100. See R. A. Cram, *The Cathedral of Palma de Mallorca*, 1932.

**Palma, La** (San Miguel de la Palma), most westerly of the Canary Is., in the prov. of Santa Cruz de Tenerife (q.v.). It is mountainous (Pico de la Cruz, 7760 ft), with deep gorges, is well wooded, and is very fertile. Wine, sugar, honey, fruits, wax, and silk are produced. The cap. is Santa Cruz de la P., on the E. coast. Area 281 sq. m. Pop. 70,000.

**Palma del Condado**, La, Sp. tn in the prov. of Huelva, well known for its wines. Pop. 8500.

**Palma di Cesnola**, see CESNOLA.

**Palma di Montechiaro**, tn in Sicily (q.v.), 12 m. SE. of Agrigento (q.v.). It has a trade in fruit, sulphur, soda, and almonds. Pop. 17,000.

**Palma Giovane** ('The Younger'), Jacopo (Giacomo) (c. 1544-1628), It. painter. He was the grand-nephew of P. Vecchio (q.v.). He imitated Titian, Tintoretto, and Paolo Veronese, and studied the antique at Rome (1559-67). The architect A. Vittorino became his patron and obtained innumerable commissions for him. Among his works are 'St Catherine rescued from the Wheel,' 'Madonna with Saints,' 'The Brazen Serpent,' 'Resurrection of Lazarus.' See G. Morelli, *Italian Masters in the German Galleries*, 1883; and P. Locatelli, *Notizie intorno a G. Palma*, 1890.

**Palma Vecchio** ('The Elder'), Jacopo (Giacomo) d'Antonio de Negreti (c. 1480-c. 1528), It. painter of the Venetian school, b. Serinalta, near Bergamo. He studied under Bellini and others. Among his best works were 'Santa Barbara' (Venice); 'A Holy Conversation' (Naples and St Petersburg); 'St Jerome,' 'The Virgin Enthroned' (Vicenza); 'Adoration

of the Magi,' and various portraits. See J. A. Crowe and G. B. Cavalcaselle, *History of Painting in North Italy*, 1871; M. von Boeln, *Giorgione und Palma Vecchio*, 1908; and life by A. Spahn, 1932.

**Palmas, Las**, see LAS PALMAS.

**Palmer, Herbert Edward** (1880- ), poet and critic, b. Market Rasen, Lincs. Educ. at Woodhouse Grove School, Birmingham Univ., and Bonn, he became a schoolmaster, but in 1921 gave up teaching for writing. After sev. vols of poetry he pub. *Collected Poems* in 1932, and followed this with *Sword and Chasm*, 1934, *The Vampire*, 1936, *A Sword in the Desert*, 1946, and *The Old Knight*, 1949. *Post Victorian Poetry*, 1938, is a book of criticism, and *The Mistletoe Child*, 1935, a vol. of early reminiscences.

**Palmer, John** (1742-1818), projector of mail-coaches in England, b. Bath. He put forward a scheme to Pitt for running mail-coaches, and the first started from Bristol in 1784. The idea was promptly taken up, and services multiplied rapidly throughout the country. P. became comptroller-general of the post office in 1786, but was dismissed (1793) because of his frequent quarrels with Lord Walsingham, the postmaster-general. He was granted £50,000 as compensation in 1813.

**Palmer, Sir Roundell**, see SKELBORNE.

**Palmer, Samuel** (1805-51), landscape painter and etcher, son of a small bookseller at Newington, Surrey. He was sent to the Merchant Taylors' School; he discovered his powers there, and as early as 1819 showed 3 pictures at the Royal Academy, a remarkable record for a boy of 14. At this same exhibition he was excited by Turner's 'Orange Merchantman,' but his great experience in youth was his meeting with the aged William Blake, whose character and art deeply impressed him. He and other worshippers of Blake formed a group at Shoreham, Kent, called 'the Ancients,' between 1820 and 1833, and in this period P. excelled, mainly in sepia and water-colour. His best works show a genuine, if limited, imagination, and express a personal and emotional vision of nature. See G. Grigson, *Samuel Palmer: the Visionary Years*, 1947.

**Palmer, Vance**, see AUSTRALIAN LITERATURE.

**Palmer, William Waldegrave**, see SELBORNE, SECOND EARL OF.

**Palmer** (medieval Lat. *palmarius*, from *palma*, a palm), one who, having made a pilgrimage to the Holy Land, returned carrying a palm-leaf as a sign of his accomplished pilgrimage. The title was later applied to itinerant religious men who spent their whole time in such pilgrimages, subsisting on charity. It is also frequently used merely as an equivalent to 'pilgrim.'

**Palmerston, Henry John Temple**, third Viscount (1784-1865), statesman, b. Broadlands, near Romsey, Hants, and educ. at Harrow and St. John's College, Cambridge. He succeeded in 1802 to the Irish peerage, and 5 years later entered the House of Commons. Within 12

months, he became lord of the admiralty under the Duke of Portland, and in 1809 accepted the secretaryship of war, which, under various Prime Ministers, he held until 1828. He became foreign minister under Grey (1830), and remained in that office (except during Peel's brief administration) until 1841. In this great position he maintained and even increased the prestige of England, which was never higher in the 19th cent. than when he was at the Foreign Office. In opposition until 1846, in that year he became foreign secretary under Russell, and in 1850 made his famous *civis Romanus* speech, in which he estab. his reputation as an orator and won the hearts of his countrymen. When in 1851 he expressed his approval of Napoleon's *coup d'état*, without having consulted the queen or his colleagues, he was, at the demand of her majesty, dismissed from office by Lord John Russell. He became home secretary under Aberdeen in 1852, and strongly advocated a firm attitude against Russia. The Crimean war broke out in 1854, mismanagement was rampant, and Aberdeen (q.v.) resigned in the following year. By general consent, P. became Prime Minister, and his vigorous action soon brought about a more satisfactory condition of affairs. He was defeated in 1857 on the China war question, whereupon he dissolved Parliament and appealed to the nation, and was promptly returned to power. He was defeated again the following year on the Conspiracy to Murder Bill. In the meantime, however, he had suppressed the Indian Mutiny, 1857-8. In 1859 he again formed a gov., and so strongly was he supported that it was said that he was 'Prime Minister for life,' his following being almost entirely personal. Gladstone was chancellor of the exchequer in this administration, and he and P. were men of widely differing temperaments and ideals. In this, his second administration, P. furthered the cause of free trade, but made the mistake of allowing the *Alabama* (q.v.) to leave Birkenhead. He d. in office and was buried in Westminster Abbey.

P. was to many of his contemporaries the ideal Eng. minister, firm, tactful, humorous, and blessed with great common sense that enabled him to extricate the country and himself from awkward places. He was the most popular Prime Minister of the day, and, except in connection with the Conspiracy to Murder Bill, could always rely upon being supported. P. was, after 1832, uninterested in further parl. reform, and his autocratic character meant that his party shelved its proposed measures on this subject until after his death. Home affairs, in fact, never really interested him, and for the last 30 years of his life his views on most domestic subjects were far more conservative than those of the majority of his party. In character and policy he expressed the self-confidence of the ruling classes of his era; his high-handed attitude to the great powers of Europe and his support for the weaker nations (he was largely responsible for the creation

of an independent Belgium, and his actions did much to further it. unity—though throughout he was, of course, motivated by Brit. interests, and not by philanthropy) gained him a reputation far beyond his own country. But at the end of his life Bismarck (q.v.) called P.'s bluff on the Schleswig-Holstein question, and it is open to doubt whether P.'s methods of blustering bellicosity would have been so successful had a Bismarck arisen to challenge him 30 years earlier. See A. E. M. Ashley, *The Life and Correspondence of Henry John Temple, Viscount Palmerston*, 1879; P. Guédalla (ed.), *The Palmerston Papers: Gladstone and Palmerston*, 1928; and H. C. F. Bell, *Lord Palmerston*, 1936.

Palmerston, one of the N. Cook Is. It is 1 sq. m. in area, and inhabited by about 90 of the descendants of the late Wm. Marsters, an Englishman who in 1862 settled there with 2 native women, 'his wife and her sister, both from Penrhyn Is.; later a third Penrhyn woman joined them. He forbade the use of the native tongue, and to this day a form of Eng. is spoken. Copra is the main product, collected by schooner twice a year.

Palmerston North, city in Manawatu dist., Wellington Prov., N. Island, New Zealand, 87 m. N. of Wellington. The centre of a thriving dairy and sheep-raising country, it was proclaimed a city in Aug. 1930. There is an agric. college. Pop. of urban area 37,750.

Palmetto Leaves, leaves of *Sabal palmetto*, a fan-palm, native of Central America, which are used in making hats and mats.

Palmetto State,' see under SOUTH CAROLINA.

Palmgren, Selim (1878-1951), Finnish pianist, conductor, and composer, b. Hörneborg. He studied at the Helsinki Conservatory, in Germany and Italy. He married the singer Maikki Järnefelt, toured Europe and the U.S.A. with her, in 1923 became prof. of composition at the Eastman School of Music at Rochester, New York, and in 1936 at the Sibelius Academy in Helsinki, where he d. His works include operas, incidental music, choral works; two pianoforte concertos, *Metamorphoses* and *The River*; and numerous pianoforte pieces, etc.

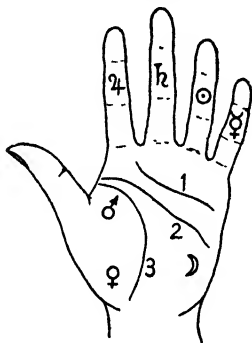
Palmiet, see PALMITE RUSH.

Palмира, tn of Colombia, in the dept of Valle, and 15 m. E. of Cali. It is situated on the Llanos de Malajana at an altitude of 3500 ft. Grows tobacco, coffee, cacao, sugar, and rice, and has an experimental agric. station. It is reached by rail from Buenaventura 144 m.). Pop. 21,250.

Palmistry, or Cheiromancy (Gk *cheir*, hand, *mantikē*, divination or prophecy), the art of reading a person's character and the chief events of his life from the general contours of his hand, and, in particular, from the lines upon the palm. Though in modern times it has fallen into disrepute through being exploited for gain by more or less ignorant 'fortune-tellers', it was in early times highly esteemed, and is mentioned with respect



by Pliny, Aristotle, and other ancient writers. The different parts of the hand are named after the planets, the thumb belonging to Venus (?), the first finger to Jupiter (♃), the second to Saturn (♄), the third to Apollo or the Sun (☉), and the fourth to Mercury (☿), while there are also the 'mounts' of the Moon (☾) and of Mars (♂). The chief lines are those of heart, head, and life (1, 2, and 3 in diagram), but all small markings, crosses, etc. must be taken into consideration, the rules upon which an adequate judgment is based being extremely complex. It is claimed that the lines are continually altering in accordance with the development of a person's tastes and character; also that markings signifying particular events appear temporarily and



vanish when the event has taken place. See S. D'Arpentigny, *La Chirognomie*, 1843; A. Desharrolles, *Les Mystères de la main*, 1859; E. Beasmish, *The Psychonomy of the Hand*, 1865; A. Raphael, *Chiroscopy*, 1901; W. G. Benham, *The Laws of Scientific Hand Reading*, 1901, and *How to Choose Vocations from the Hands*, 1932; and Cheiro, *The Language of the Hand*, 1911.

**Palmite** Rush, or **Palmiet** (*Prionium palmita*), evergreen perennial plant (family Juncaceae), native of S. Africa, with broad, linear leaves, which are deeply channelled and finely serrated, and small greenish-golden flowers. The leaves are used in thatching, and the fibre in the leaf sheaths is sometimes employed in brush making.

**Palmitic Acid** (Hexadecanoic,  $C_{16}H_{32}COOH$  or  $CH_3(CH_2)_{14}COOH$ ), most important and most abundant of the saturated fatty acids, found widely distributed as mixed glycerides in animal, vegetable, and marine fats and oils. It is a major constituent of lard, tallow, palm oil, and cocoa butter, and is a tasteless, odourless, and hard crystalline substance, melting to a colourless liquid at  $63^\circ C$ . Commercial P. A. derived from natural fats usually contains stearic acid, and is converted into mono- and diglycerides, water-soluble alkali-metal soaps or salts, and oil-soluble, water-insoluble 'metallic' soaps. Prin. uses of the derivatives are—

as emulsifying agents in edible products, cosmetics, shaving-soaps and creams, high-temp. washing soaps, etc., as 'driers' or thickening and levelling agents in paints, enamels, varnishes, and other protective coatings; as thickening or gelling agents in lubricants, and as components of waxes and polishes. See **FATTY ACIDS**.

**Palmyra**, ancient city standing in an oasis of the Syrian desert, 150 m. N.E. of Damascus. It is now a mere collection of Arab huts, but wonderful ruins exist. It is called by the Arabs Tadmor, and is supposed by some to have been founded by Solomon (2 Chron. viii. 4). This can scarcely be the case, P. having been a flourishing city some considerable time before that given for Solomon's birth. It formed a halting-place for the caravans between Syria and Mesopotamia, and hence grew into a rich, commercial city. The bulk of the pop. was of Arab blood. The city reached its greatest period of wealth and splendour under Hadrian and the Antonines. (For the revolt of the Palmyrenes against the Romans see ZENOBIA.) P. was destroyed by Aurelian, AD 273, and the inhab. massacred. It never recovered its former glory. Remains include a temple of the sun, walls, and a colonnaded street with a triumphal arch. See M. I. Rostovtsev, *Caravan Cities*, 1932; D. M. Robinson, *Baalbek; Palmyra*, 1946.

**Palni Hills**, ranges of mts in the W. of the Madnra dist., Madras, India, consisting of an E. and W. range, and reaching a height of 7000 ft. On the lower slopes are many plantations of tea, coffee, and cardamoms.

**Palo Alto**: 1. Banking tn of Santa Clara co., California, U.S.A., 30 m. SE. of San Francisco. It produces canned fruits, dairy products, Roentgen-ray tubes, and insecticides. Stanford Univ. (opened 1891) is 1 m. away, and there is a Rom. Catholic theological seminary. Pop. 25,475.

2. Battlefield of Cameron co., S. Texas, U.S.A., between Point Isabel and Matamoros. The Americans, under Taylor, defeated the Mexicans here (1846).

**Palo Worm** (*Leotie viridis*), annelid which is widely distributed around the S. Pacific Is. It makes its appearance once a year at the full Oct. moon on the surface of the seas around Samoa and the Fiji Is. It occurs in vast numbers, and the natives value it highly as a food, eaten raw.

**Palomar**, mt in California, U.S.A., 35 m. inland from the coast, and 66 m. N. of San Diego, a peak of the Santa Anna Mts. There is an observatory with a 200-in. reflector, the largest in the world (see MOUNT PALOMAR OBSERVATORY).

**Palomides**, Sir, see **PALAMEDES**.

**Palomino de Castro y Velasco**, Don Aciselo Antonio (1643-1726), Sp. painter and writer on art, sometimes called the 'Sp. Vasari', b. Bujalance, Cordova. He assisted Coello with the frescoes of the queen's gallery in the Alcázar (1686), and was appointed court painter to Charles II (1688). On his wife's death in 1725 he took priest's orders. His oil-paintings

were better than his frescoes, but he is chiefly remembered for his *El Museo pictórico y escala óptica*, 1715-24, of which the third part, with the sub-title, *El Parnaso español pintoresco laureado*, contained biographies of Sp. painters. Abridgements appeared in England (1739) Spain (1742, 1744), France (1749), and Germany (1781), and a reprint of the whole work in Spain in 1797. See J. A. Cuan-Bermudez, *Diccionario de los mas illustres profesores de las bellas artes en España*, 1800; and Sir W. Stirling-Maxwell, *Annals of the Artists of Spain*, 1848.

Pálsson, Bjarni (1719-79), Icelandic naturalist and physician, with Eggert Ólafsson (q.v.) explorer of Iceland and joint author of their famous *Reise gjennem Island* (Sorðe), 1772, which did more than any other work to disseminate factual knowledge of that country. P. did much to effect sanitary reform in the country.

Palsy, see PARALYSIS.

Paludan-Müller, Frederik (1809-76), Dan. poet. b. Kerteminde. He studied law at Copenhagen Univ., but never practised. Whilst there he pub. 4 little romances, and inspired by his study of Shakespeare and Gozzi produced the romantic drama *Love at Court* in 1831, and gained thereby his passport into the society of belles-lettres of the cap. His successful *Dandserinden*, which shows traces of Byron's influence, appeared in 1832. *Amor and Psyche*, probably his most finished work, was pub. in 1834. He settled down to a quiet and studious life in a cottage on the royal estate at Fredensborg. *Zuleima's Flight* and *Beatrice* were written in 1835-8, *Venus* in 1841. During 1841-8 he was engaged upon his greatest work, which has become a Dan. classic, *Adam Homo*. This was followed in 1844 by the 3 graceful idylls, *The Dryad's Wedding*, *Tithon*, and *The Death of Abel*. Excepting the drama of *Kalanus* in 1854, P. afterwards produced nothing of particular merit for some years, until he composed with all his former charm and power what was to prove his 'swan-song,' the beautiful poem *Adonis*, 1874. See V. Andersen, F. Paludan-Müller (2 vols.), 1910; M. Martensen-Larsen, *Den virkelige F. Paludan-Müller*, 1924.

Paludi Pontine, see PONTINE MARSHES.

Paludrine or Proguanil Hydrochloride,  $C_{11}H_{12}N_4Cl$ , antimalarial drug first synthesised in 1944. Up to that time the chief drug used to fight malaria was quinine. P. not only destroys the malaria parasites in the blood, but when administered at the correct time prevents the infection from developing. It is well tolerated in man; doses up to 1.5 grams a day have been given, while as little as 10 milligrams a day gives an action in the clinical phase of malaria. See MALARIA.

Palyngology, the science of pollen-analysis. Besides its use in honey and hay-fever investigations, the analysis of fossil spores and pollen is important in palaeobotany (q.v.). Pollen grains extracted from Quaternary peats, Tertiary

brown coals, and other deposits can not only be used as index fossils enabling regional correlations to be made, but also allow the composition and migration of aet forests, and fluctuations in past climates to be worked out. See K. Faegri and J. Iversen, *Textbook of Modern Pollen Analysis*, 1950; and G. Erdtman, *An Introduction to Pollen Analysis*, 1954.

Pamaquin,  $C_{10}H_{14}O_4N_2$ , synthetic drug used against malaria. It occurs as a granular, pale-yellow powder, and may be used either alone or alternating with mepacrine or quinine. P. is a toxic drug, and the margin between the therapeutic and the toxic dose is small. For this reason it is used in very small doses in combination with quinine or alternated with mepacrine. P. is too toxic for use as a prophylactic. See MALARIA.

Pamfil, Giovanni Battista, see INNOCENT (popes), Innocent X.

Pamiers, Fr. tn, cap. of an arron., in the dept of Ariège, on the Ariège. It is the seat of a bishopric, and has an iron industry and a trade in garden produce. Pop. 12,000.

Pamirs, mountainous region forming the nucleus of the central Asiatic highland system. They connect the highlands of the Hindu Kush and Karakoram with those of the Tien Shan and Kunlun, whilst the depressions of the Amu and of E. Turkestan border the region, which is termed by natives the 'Roof of the World' (*Bam-i-Dunya*); the word *pamir* (meaning an upland plain or valley) being a name there applied to the riv. valleys. On 3 sides the plateau is bordered by high mts; on the SW. there is no such mt wall, but an abrupt descent to the valley of the Panj. The length of the P. is about 280 m., and breadth from 120 to 150 m., the area being about 30,000 sq. m.

The chief peaks in the N. are Stalin Peak (24,590 ft) and Lenin Peak (23,383 ft), in the E. Murtagh Ata (24,388 ft). Across the plateau ridges run in various directions, principally from E. to W., enclosing the P., or flat, broad riv. plains. The chief rivs. of the P. are the Wakhan (afterwards the Panj) and the Murgab R., both rising in Lake Oikul, and descending to the Aralo-Caspian depression. The ridges running across the P. are crossed by passes, notably the Andamin Pass (15,500 ft), from the Great to the Little P., and the Khargosh Pass (14,550 ft) from the Great Pamir to the Tareh Pamir. Many lakes are found on the P. The prin. P. are the Khargoshy Pamir, round Great Karakul Lake, Rang-Kul, and Alichor; the Great Pamir, round Lake Zorkul; the Little Pamir, round Lake Oikul; and the Taghdumbash Pamir. The theory of Younghusband is that these elevated plains were originally deep riv. gorges, which have gradually been filled up because the debris falling from the mts on either side has accumulated too rapidly to be washed away by the streams. The culminating point of the P. region is reached in the Kunlun Mts. and between the Murtagh Ata and the Tien Shan the mean altitude is about 20,000 ft, whilst the average

height of the P. as a whole is over 12,000 ft. The climate is colder in the centre of the plateau, and the snowfall less than in other parts. The whole region is destitute of trees or shrubs; along the banks of the streams fine pasture is found, to which the Kara-Kirghiz nomads bring their flocks in summer. These are practically the only inhab. of the P., though the peripheral dists. are inhabited by Tajiks. The Russian surveys of Grombchevsky, Bogdanov, Featschenko, Muschketov, and Severzov, and the journeys of Mr and Mrs Littledale, M. Dauvergne, Dr G. Capus, Sir Francis Younghusband, Sven Hedin, Sir Aurel Stein, etc., have much increased the knowledge of the geography of the region. The P. are for the most part in the Tajik S.S.R. See Lord Dunmore, *The Pamirs*, 1893; Report of the Boundary Commission, 1897; Sven Hedin, *Through Asia*, 1898; E. E. Shipton, *Mountains of 'Tartary'*, 1951.

**Pampa, La, see LA PAMPA.**

**Pampas** (*Quichuo*, 'plains') are wide, treeless plains found in the Argentine Rep., stretching from Rio Colorado N. to Gran Chaco, and from the foothills of the Andes E. to Paraná and the Atlantic coast. They rise gradually from the ocean, and the E. portion is covered with grass, and supports large herds of cattle, sheep, and horses, whilst the W. is more sterile. The soil of the P. consists of sands and clays. The characteristic vegetation is the 'pampas' grass (g.v.), which grows to a height of 8 or 9 ft. Birds are more numerous than other species of fauna. Area about 250,000 sq. m. The name P. is also applied to other similar plains on the Atlantic coast.

**Pampas Grass**, genus of beautiful and almost hardy S. Amer. perennial grasses. *Cortaderia argentea* and varieties are the best known in gardens, and on light, deeply worked soils and in sheltered positions will survive sev. degrees of frost. The large, upright, plume-like, white or silvery panicles of flowers appear in Sept. and Oct. *C. quila*, a less hardy species, bears taller rose-coloured panicles.

**Pampas Hare, see VISCACHA.**

**Pampas River**, S. central Peru, 200 m. long, rises in Andean lakes in Cordillera Occidental.

**Pampeluna, see PAMPLONA.**

**Pamphlet** (from medieval poem entitled *Pamphilus*, taken as type of small book), in a general sense signifies a small treatise occupying fewer pages than a book, on some question or subject of current or temporary importance of a social, personal, political, or eccles. nature, controversial or otherwise, in which the writer endeavours to appeal to the public. Speaking technically, it implies 8 or more pages of printed matter not exceeding 5 sheets, stitched together, with or without a thin paper cover. It is first found in the Lat. form *pamphletus* in Richard de Bury's *Philobiblon*, 1344, and early made its appearance in Eng. literature, Oocleve using the words 'though that this pamphlet' in *De Regimine Principum*, 1412. Lydgate relates in *Minor Poems*, 'which

in a paunflet I redde,' 1430, and in Caxton's 1490 ed. of *Eneydos* we find 'dyverse paunflettis and bookys.' An immense impetus was given to P. writing by the Marprelate controversy in 1589, as instanced by the writings of Nashe, Thomas Cooper, the Harveys, and others. The various witch controversies of the period, especially in the case of the Lancashire trials of 1612 recorded by Thomas Potter, helped to increase the output. Richard Greene likewise caused diversion by his social P.s exposing the rogues of Elizabethan London, the most famous being *A Notable Discovery of Coosnage*, 1591, and *A Defence of Coney-Catching*, 1592. Contemporary with these are those quaint literary productions, the tobacco P.s, and political P.s and news-sheets (the germ of the modern newspaper) began to appear. Political P.s were to multiply quickly during the Caroline reigns, helped by the intervening period of rabid Puritanism, culminating in Anne's time in what Dr Johnson designated the age of P.s, enlisting such able pens as those of Addison, Steele, and Swift. In England such matters as the Corn Laws, Home Rule, the S. African war, Imperial Federation, and in France the Dreyfus case may be cited as having brought forth their full share of this class of literature. A series of well-informed P.s was issued during the Second World War by the Oxford Univ. Press, entitled 'Oxford Pamphlets on World Affairs,' and dealing with the foreign policies of different countries, the economics of the war, racial questions, and special problems. See *British Pamphleteers from the 16th to the 20th centuries*, vol. I, ed. G. Orwell and R. Reynolds, 1948, vol. II, ed. R. Reynolds and A. J. P. Taylor, 1951.

**Pamphylia**, ant. country on the S. coast of Asia Minor, bounded by Lycia and Cilicia. The chief tns were Aspendus, Perga, Attalia, and Olbia. This country formed at first part of the Persian Empire, but afterwards passed successively to Macedonia, Syria, and Rome.

**Pamplona**: 1. (or Pampeluna; Basque Iruña) Sp. tn, cap. of the prov. of Navarra, on a hill by the Arga. Once cap. of the kingdom of Navarra (q.v.), it has often been besieged. There are a beautiful Gothic cathedral, with an 18th-cent. façade, other ant. churches, fine old houses, and remains of the medieval walls. Pop. 75,450.

2. Tn of Colombia, in the dept of Norte de Santander, 210 m. NE of Bogotá, at an altitude of 7670 ft. It is connected by rail with Cucuta and Encencontrados. It is an episcopal see, and is in the vicinity of abandoned gold and silver mines. Other minerals, including iron, coal, lead, and copper, are found in the neighbourhood. Its chief products include dyewoods, gums, coffee, cacao, coal, and gold. There are breweries and distilleries, and also textile factories. Pop. 13,100.

**Pan**, Arcadian god of flocks and shepherds, son of Hermes, a god of Arcadia, which originally was always the prin. seat of his worship. His name and worship spread over Greece, but at Athens

were not introduced till the time of the battle of Marathon (490 BC), before which he was believed to have appeared to the runner Pheidippides. He is described as wandering among the mts and valleys of Arcadia, amusing himself with the chase, or leading the dances of the nymphs. He loved music, and invented the syrinx or shepherd's flute. P., like other gods of the forests, was dreaded by travellers, to whom he sometimes appeared, and whom he startled with sudden inexplicable terror, a *Panic* fear. The Romans identified their god Faunus with P. P. is represented as a sensual being, with horns and goat's feet, sometimes dancing and sometimes playing on the syrinx. See J. C. Lawson, *Modern Greek Folklore and Ancient Greek Religion*, 1910.

**Pan-American Conference, or Congress.** The first P.-A. C. was convened at Panama in 1826 by Simon Bolivar, the Venezuelan patriot, representatives from Colombia, Peru, Mexico, and Guatemala attending. An attempt was made to effect a treaty of federation, but the congress failed to do so, though it had far-reaching results in the direction of fusing Lat.-Amer. aspirations for their own corporate protection. This aim was definitely stated at the congress in 1856, when Peru, Chile, and Ecuador signed a continental treaty. The movement was hostile to the U.S.A., and in 1889 the U.S. Gov. invited Lat.-Amer. republics to a conference to discuss such questions as peace, customs, and communications. All the republics attended, and recommendations regarding port duties, sanitation, freedom of rivers, common weights and measures standards, extradition of criminals, and intercontinental railways were considered. At further conferences in 1901, when President McKinley attended, and 1906 and 1910, agreement was reached on arbitration in disputes, adherence to The Hague Convention of 1899 was agreed to, money claims adjusted, and the formal dedication of the Pan-Amer. Union (q.v.) was made. At the conference in 1923 Peru, Bolivia, and Mexico refused to attend. Three conventions were adopted, as follows: international disputes were to be examined by a commission, trade-marks were protected, and customs documents were to be pub. The sixth congress, held in 1928, was attended by President Coolidge, when public and private international law was coded, and the subject of aerial navigation reviewed. Various Pan-Amer. scientific congresses have taken place. In 1915 President Wilson attended one, when discussions took place respecting improvement of cable services, telegraph and railway co-ordination. The seventh conference, held at Montevideo in 1933, was attended by all the Amer. republics except the Argentine, and the U.S.A. and 9 other states sent their foreign ministers. This important conference gave Franklin Roosevelt's administration its first opportunity to expound the 'good neighbour policy' (see further under MONROE DOCTRINE). A declaration that 'no

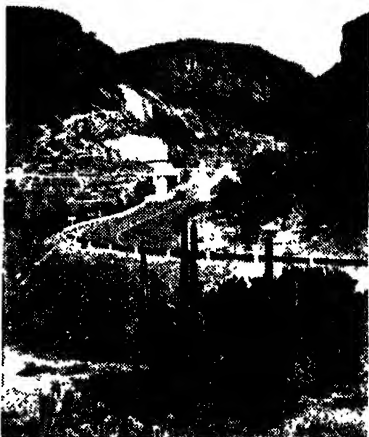
state has the right to intervene in the internal or external affairs of another' was strongly supported by Mr Cordell Hull (q.v.) and unanimously adopted. This conference adopted over 100 recommendations for the promotion of inter-Amer. amity. Noteworthy, too, was a resolution for the removal of trade barriers, including high tariffs, a welcome reaction from the scandal of the Hawley-Smoot tariffs. President Roosevelt followed up this conference by proposing a special conference on the maintenance of peace, which met in Buenos Aires at the close of 1936, the opening session being addressed by him in person. Its most important result was a convention for the maintenance, preservation, and re-establishment of peace, which provided for general inter-Amer. consultation if any threat of war touched the New World, whether with an Old World nation or war between 2 Amer. nations. A treaty on the prevention of controversies set up a number of mixed commissions between Amer. states to devise means of avoiding future conflicts, and a new protocol raised still higher the barrier against intervention by any one of the signatories 'for whatever reason in the internal or external affairs of any of the other parties.' The U.S. Senate ratified the peace convention or consultative pact. The eighth conference, held in Lima in 1938, met under the shadow of a second world war. Mr Hull, apprehensive of Ger. penetration of S. America, wished to form a united front against international aggressors; but Argentina was opposed to drastic action, and late in the war was the one Amer. republic to maintain an equivocal attitude towards the belligerents, even after Brazil, Mexico, and others had actually declared war on the Axis. However, the Declaration of Lima, adopted unanimously, affirmed the faith of the 21 Amer. republics in democracy and pledged them to consultation and, at least, to a measure of common action if any were menaced. Thus, under the impulse of common danger, Pan-America did at length achieve something for concord and security in the W. hemisphere, besides fostering closer commercial and cultural relations. In accordance with the Declaration of Lima, the foreign ministers of all the republics met for consultation at Panama city soon after the Second World War began. They adopted a statement of co-operative neutrality, defining their rights and privileges in a world at war. The Declaration of Panama asserted, though rather unrealistically, their inherent right to keep the waters used for normal inter-Amer. maritime communications 'free from the commission of any hostile act by any non-Amer. belligerent,' and to that end they adopted a neutrality zone (q.v.), which, however, never came into effect. The collapse of France led to a new meeting at Havana in July 1940, which resulted in the Act of Havana, an act which went far towards extending the Monroe Doctrine. This was an effort to safeguard Brit., Fr., and Dutch possessions in the

W. hemisphere from Ger. seizure. The delegates also adopted a declaration to the effect that any attempt by a non-European state against the integrity of the ter. or political independence of an Amer. state should be considered an act of aggression against all the New World republics. In fact, the Monroe Doctrine had now become a multilateral doctrine. After the Japanese had attacked the Amer. fleet at Pearl Harbour it is obvious that all the S. Amer. republics should have given practical expression to this joint declaration by breaking with the Axis, and but for the resistance of Argentina this step would never have been delayed. The foreign ministers of all the republics again met, this time at Rio de Janeiro in Jan. 1942, and a declaration recommending severance of diplomatic relations was adopted, with Argentine and Chilean reservations; indeed, Argentina's ambiguity was the great obstacle to a united Pan-Amer. front. Soon after this conference Brazil, Bolivia, Ecuador, Paraguay, Peru, and Uruguay broke off relations with the Axis. Mexico had done so before the conference, at the end of 1941. Other congresses have met since (Bogotá, 1948; Caracas, 1954; Buenos Aires, 1957), but regional disputes and fears of U.S. preponderance have vitiated their effectiveness. See also PAN-AMERICANISM.

**Pan-American Highway**, planned in 1924 to connect N. America with the Central and S. Amer. reps. Funds are being supplemented by U.S. and World Bank assistance. Short stretches of exceptionally mountainous terrain remain to be completed, notably in the Central Amer. states and S. Ecuador.

**Pan-American Union**. In 1890 an International Union of Amer. Republics was convened to organise the pub. of comprehensive commercial data in a bulletin issued monthly in the 4 languages of England, Spain, Portugal, and France. From this beginning there grew the P.-A. U. in 1911 at a congress in Buenos Aires. The stated objects of the union are to develop inter-republic commercial and diplomatic relations and to organise co-operation in communications, customs, etc. A library was developed, called the Columbus Memorial Library. The widening scope of the work of P.-A. U., and the creation of specialised inter-Amer. agencies, made it clear that greater integration was required, and accordingly the ninth international conference of Amer. states, held in 1948, adopted a charter for the organisation of Amer. states. Membership comprises the 21 Amer. republics on a basis of equality, and its aims are accomplished by sev. bodies, as follows. An inter-Amer. conference meets every 5 years. The ministers of foreign affairs meet to consider urgent or common problems, assisted by an advisory defence committee. The council of the organisation, with one representative of ambassadorial rank, supervises progress either directly or through technical organs, i.e. the Inter-Amer. Economic and Social Council, the Inter-Amer.

Council of Jurists. The permanent and central organ of the organisation, housed in Washington, is the P.-A. U., which acts as a permanent secretariat and as a clearing-house for information about the member countries. Specialised conferences deal with technical matters or specific questions of co-operation, and specialised organisations are estab. to fulfil specific functions in agriculture, education, or sciences.



*Acme Photo. U.S. Information Service: American Embassy*

#### THE PAN-AMERICAN HIGHWAY IN MEXICO

From this point the road begins to climb to an elevation of almost 9000 feet.

**Pan-Americanism**, movement intended to bring the Amer. republics into closer association for the promotion of trade, cultural interests, peace, and security. Its fundamental object has no necessary connection with the Monroe Doctrine, but in effect the decisions reached at various Pan-Amer. conferences involve the application of that doctrine in its wider, modern interpretation (see further MONROE DOCTRINE). In more recent years U.S. leaders have favoured the inclusion of Canada in the Pan-Amer. system, and the formation during the Second World War of the Canadian-Amer. Defence Board marks the inevitable development of this tendency. The ideal of P.-A. has its origin in the time of Henry Clay (q.v.), but for a number of reasons it made only very slow progress. A serious obstacle is or was the fact that Latin America (q.v.)

has always had much stronger ties, cultural, moral, and economic, with continental Europe, especially with Spain and Portugal, than with the U.S.A. Secondly, the S. Amer. republics for long regarded U.S. foreign policy with deep suspicion. Thirdly, there is, even to-day, a difference in governmental ideals; for, whereas the people of the U.S.A. abhor dictatorships, many S. Amer. states have found them apparently well suited to their stage of political progress. Hence in most Pan-Amer. conferences it has been difficult to discuss political aims from a common standpoint. Fourthly, there is a radical difference between the outlook and temperament of the Latin Americans and the Eng.-speaking Americans: the latter seem to regard the former as indolent, changeable, and unprogressive, while the former, especially the Argentines and Chileans, are prone to regard the N. Americans as aggressive, materialistic, and irreligious (Allan Nevins, *America in World Affairs*, 1941). See PAN-AMERICAN CONFERENCE. See also J. A. Houston, *Latin America in the United Nations*, 1950.

**Pan-Arabic Movement**, or the movement for an Arab union or federation. Arabia proper forms only a small part of the Arab world, and not even the most comprehensive programme for an Arab union or federation could look to the political unification of this whole area as a practical proposition (see also ISLAM). Moreover, the Arabic-speaking countries in N. Africa to the W. of Egypt (Libya, Tunisia, Algeria, and Morocco) down to 1944 held aloof from the current movement for union. But within the E. half of the Arab world, a smaller and more compact group of ters., the peoples of which are not exclusively or even predominantly of Arab origin, have in the course of centuries become thoroughly Arabised, speak Arabic, and consider themselves Arabs. Yet hitherto they have been kept apart by mutual jealousies and suspicions, and by the centrifugal force which the geographical peculiarities of the Arabian peninsula have always exerted. Hence the Nejd has never been the nucleus of an Arab state extending beyond the limits of Arabia proper, and only the Umayyad caliphs of Damascus (661-750) succeeded in holding the Arab countries together during the period of their sway, and from 868 their successors had to submit to the existence of virtually independent dynasties in Syria and Egypt. In Arabian hist. it was exceptional for the majority of the Arab countries, which owed formal allegiance to the caliph of Bagdad, to be united under a single ruler. Egypt and Syria formed a unit of this kind for some centuries, and the Ottoman Turks, early in the 16th cent., united the whole region into a single state, though one of Turkish character with its cap. at Constantinople. The scheme of Mehmet Ali (q.v.) to rival the Ottoman caliph was thwarted by the great powers, but, in any case, there existed then no Arab nationalist consciousness such as exists to-day. The origin of the Arab union movement of recent years may be

traced back to about 1906, in the growing aversion of the Arabs to Turkish hegemony. Although the positive side of this movement was vague, the existence of a common national feeling in the Arab provs. of the Ottoman Empire was an undoubted fact by 1913, and it had been influenced by the increasing tempo of European nationalism. The experiences of the Arabs during the First World War contributed greatly to strengthening the bonds between them, while the Brit. Gov.'s pledge of 1918 to give the Arabs full opportunities of becoming a nation again should have operated in the same direction; but in the result only Syria and Iraq really aspired to unity and, in the Arabian peninsula, there can, even to-day, be no question of nationalism in the W. sense, while, again, Egypt's independence was founded on local patriotism. The great differences in the standards of civilisation and in economic resources, as well as among the various classes of society in each, formed, and still form, the main obstacle to union. At the Paris Peace Conference after the First World War the idea of an Arab union was voiced by the Hejaz delegation against a Syrian movement for local independence. The settlement of the Arab question after 1918 resulted eventually in the independence of Arabia proper (Saudi Arabia and the Yemen) and, later, of Iraq, Egypt, Syria, and the Lebanon. But many years passed before superficial disagreements, both inside and outside the Arab peninsula, were overcome, or even before the mutual estab. of diplomatic relations. King Faisal (q.v.) of Iraq fostered union between Iraq and Syria, and, since his regime, the desire for Arab unity has been strong in Iraq. The Syrian National party in 1936 embodied in their national pact the same aspiration, to be achieved by a federation of the Arab states. Arab solidarity was also manifested by the general sympathy and support given by the Arab states to the cause of the Palestine Arabs from 1936 onwards. A general Arab conference was held in Alexandria in 1944, attended by gov. representatives of Egypt, Iraq, Lebanon, Saudi Arabia, Syria, Jordan, and the Yemen, and a representative of the Palestinian Arabs. From this resulted the Alexandria Protocol, which suggested an Arab league, a covenant establishing this body being signed in Mar. 1945 (see ARAB LEAGUE).

**Pan-Germanism** (Ger. *Pangermanismus*), movement in Germany during the latter half of the 19th cent. to encourage unity between the Ger.-speaking peoples and countries under Ger. influence, i.e. Austria-Hungary, Holland, Luxembourg, Flem. Belgium, and Switzerland. An impetus to P. was given by the success of Ger. arms in the Franco-Prussian war of 1870, and from this derived 2 movements, *Einiges Deutschland* and *Grossdeutschland*. Later these were welded into one society, the *Alldentscher Verband* (1890). The First World War was an expression of P. The alliance with Turkey aimed at the extension of *Mittleuropa* to include

Constantinople. The so-called Flem. movement during the Ger. occupation of Belgium, which aimed at dissociating Flem. Belgium from the remainder and bringing it under closer Ger. influence, was also in accordance with P. So was the Ger. policy in Poland: It was proposed to give that country autonomy, but only under Ger. supervision. With Germany's defeat in the war and the dissolution of the empire into federated states, the scheme of *Mitteleuropa* collapsed and the disintegration of the Austro-Hungarian Empire seemed to have given P. its death blow. But it was revived in all its worst features under Hitler, who was brought up in the atmosphere of Austrian P. and permanently influenced by it. Hitler, however, discarded the limitations on P., and, from one annexation after another, proceeded to engulf most of Europe. See NEW ORDER.

**Pan-Islam**, an idea and a movement which became prominent in the second half of the 19th cent. In Islam all believers are equal, human inequalities shrinking to nothing in the presence of God; His law governs their lives. The first principle is more or less a fact; the second is an ideal. As long as Muslim states had little contact with Europe, the second idea was latent, expressing itself at times in protests against taxes which were not sanctioned by God's law. But when Muslims had often to deal with a more powerful Christian state or were even subject to it, the gap between the actual and the ideal shocked them into consciousness of their position. Later, speedy travel and the press brought them nearer together and they felt the subjection of their brethren to 'infidels' as their own. Jamal al-din al-Afghani was one of the first to preach resistance to Europe. Feeling was so strong that at times it broke through the age-long enmity between Sunnite and Shi'ite. One manifestation was the cult of classical Arabic, the sacred tongue of all Muslims. Turkey, the most powerful Muslim state, exploited this spirit, making connections with Muslims in all countries, encouraging the pilgrimage (see HAJJ) by building the Hedjaz railway (largely paid for by the gifts of the faithful), and exhibiting the sultan as caliph, the commander of all believers. In the middle of the 20th cent. it looks as if nationalism and the ambitions of individual rulers will defeat the internationalism of religion, and instead of P.-I. there will be Pan-Arabism. See C. H. Becker, *Islamstudien* 2, 231.

**Pan-Slavism**, movement for the union in polity and culture of all the Slav races, in which Russia has taken the lead as the great political representative of these races. The movement began about 1830, and the spread of the national spirit in Europe considerably strengthened it. A congress was held at Prague in 1848, to which most of the Slav races sent representatives. In the sixties Russia used P. as an instrument of tsarist imperialism, for strengthening the Russian hold on Poland and the Ukraine, and for furthering Russian aspirations in the Balkans and in the Austrian

empire. The congress held at Moscow in 1867 was, however, less successful than the Prague Congress, for the fear had grown that the movement was becoming no more than an instrument for the aggrandisement of Russia. In the old tsarist days Russia's pan-Slavist policy was directed mainly against the Hapsburg monarchy. The Czechs were chief adherents of P. among the W. Slavs, while the Poles, oppressed by tsardom, were its prin. opponents. The movement also affected the Russo-Turkish war of 1877 and the Balkan wars of 1912-13. Slavophil writers believed it right for the Slav people to leave the task of governing to their rulers, while retaining intellectual freedom to disapprove of what was done amiss. This justification of the existing order was obviously out of sympathy with the increasing revolutionary theories, and, with the downfall of the tsarist regime and the triumph of the revolution, P. for a time ceased to be a practical force. Mutual inter-Slav sympathies have frequently been invoked since then, but in practice they have been of little avail in face of dissensions among the Slav peoples, such as the Polish-Russian and Serbo-Bulgarian conflicts. Following the Second World War Russian foreign policy was concentrated on a deepening *cordon sanitaire* of sovietised states on her W. border as a counterpoise to the 'Western democratic bloc.' This was P. used as an instrument of Soviet imperialism.

**Panama**, republic of Central America, which prior to 1903, when it asserted its independence, was a dept. of Colombia. Its area is 28,576 sq. m., its length 480 m.; coast-line, 426 m. on the Atlantic and 767 m. on the Pacific; breadth from 3 to 110 m. It is a strip of mountainous land branching out westward from Colombia and co-extensive with the Isthmus of P. The U.S.A. recognised its independence in 1903 and, shortly afterwards, the remaining powers did so. (For the terms of the treaty with the U.S.A. relative to the P. Canal Zone see PANAMA CANAL ZONE.) But it was not until 1914 that Colombia agreed, under the treaty of Bogota, to recognise the independent status of P. This treaty was ratified by the two govs. In 1921, and in 1924 a protocol was signed by the plenipotentiaries of P. and Colombia establishing diplomatic relations between their respective countries. The W. or Costa Rican boundary was determined in 1910, but, after ratification, the question of the true demarcation was referred to the chief justice of the U.S.A., whose award, delivered in 1914, was rejected by P. The U.S. Gov. insisted on the award being upheld, with the result that the ter. in question was occupied by Costa Rica. On 2 March 1936 a new treaty between P. and the U.S.A., ratified by the U.S. Senate on 25 July 1939, annulled the former provision by which the U.S.A. 'guaranteed the independence of P.', but permitted the U.S.A., in the event of war, to defend the canal in any way necessary. The U.S. Gov. paid P. \$10m. for the Canal Zone rights and, from 1913, \$250,000

yearly. A later treaty, ratified by P. in 1936, and by the U.S.A. in 1939, increased the ann. payment to P. to \$430,000. In Sept. 1939 the president of the U.S.A. placed both the canal and the zone under the control of the U.S. Army, and in Jan. 1942 he estab. Amer. naval control over the Gulf of P. and the maritime approaches to Cristóbal. This ceased in 1947.

**Provinces and Population.** There are 8 provs., with pops. for 1950 (caps. in brackets): Bocas del Toro (Bocas del Toro), 22,392; Chiriquí (David), 138,136; Coclé (Penonomé), 73,103; Colón (Colón), 90,144; Los Santos (Las Tablas), 61,422; P. (P. city), 248,335; Herrera (Chitró), 50,095; Veraguas (Santiago), 107,000. The pop. of P. city in 1950 was 127,874, and of Colón 52,204. There are about 23,000 Brit. subjects on the isthmus, chiefly coloured people from the W. Indies. The census pop. in 1950 was 805,890, including 48,650 tribal Indians. Under the constitution the immigration of the following is prohibited: Negroes whose original language was not Sp., yellow races and original races of India, Asia Minor, or N. Africa. The official language is Sp. Some 93 per cent of the pop. is Catholic and 6 per cent Protestant. Freedom of worship is allowed.

**Constitution and Justice.** The new constitution promulgated in 1946 continued the pre-existing provisions for a National Assembly of 32 members. This was amended to 53 to meet needs of representation of an increased population, 1950. Deputies are elected by universal suffrage for 4 years. The assembly meets biennially on 2 Jan. The term of the president of the republic, elected by direct vote, is also 4 years, and he is not re-eligible for 2 more terms. The supreme court consists of 5 justices appointed by the executive.

**Education** is obligatory for all children between 7 and 15 years of age and co-education has been adopted. The gov. maintains 1004 primary schools (16 for native Indians), attended by 132,750 children in 1954, and 19 post-primary schools, with 5400 students. Illiteracy is down to 28 per cent (1950). There is a univ. and a school of arts and crafts; but a number of students are sent at the gov.'s expense to the U.S.A. and Europe for their education. The Rolivarian univ., founded at P. city in 1926, is supported by a number of other S. Amer. republics as a pledge of Pan-Amer. solidarity. A new normal school, opened at Santiago in 1938, is attended by 1160 students of both sexes. There is also a professional school for young women.

**Production.** The soil is very fertile, but not by any means fully cultivated. The chief exports are bananas (5,700,000 stems in 1954, mostly to the U.S.A.), coconuts, coconuts, hides, açai fibre, tortoiseshell, and rubber. Coffee is cultivated in Chiriquí prov. near the Costa Rican border, while timber, sugar, copaliba, sarsaparilla, iperacuanha, and rice (a very large crop, for home consumption) are also produced. Coconut-

chouc is grown near the coast by European planters, but rubber exports have been small in the past three or four decades. Beer production is a national monopoly. Whisky, gin, and rum are also produced. Tobacco is exported; cattle are reared and hides exported to some extent; pearls from the Pearl Is. and Coiba Is. and turtle-shell are also exported. P. has nearly every valuable mineral except coal, but the mines are not much exploited. The rep., possessing few industries, subsists largely on the P. Canal (in services to its employees) and on tourist and transit traffic. Exports are far below imports, the approximate figures for the 5 years before the Second World War being between 3,500,000 and 4,250,000 balboas for exports and between 18,000,000 and 23,000,000 balboas for imports; between 1940 and 1945 exports ranged between 2,000,000 and 4,500,000 balboas and imports between 24,000,000 and 40,000,000 balboas. In 1954 exports were 19,400,000 balboas and imports 72,600,000. This heavy adverse balance is met by invisible exports such as the expenditure of Canal Zone employees, U.S. Army and Navy personnel, and tourists. The greater part of the country's trade is with the U.S.A., with the U.K. in the second place, chiefly in imports from the latter.

**Communications, etc.** The P. railroad is 47 m. long and links P. city with Colón. It passes through the Canal Zone, and the bulk of the goods consigned to P. passes over it, there being no road over the isthmus. Most ships unload at Cristóbal at the entrance to the canal. There is a narrow-gauge railway between Pedregal and David and a line between David and Concepción. There is at present a road from P. city westward as far as David. Work on its extension to the Costa Rican border was expedited by Amer. engineers as a war measure so as to complete the Panamanian link in the highway from the U.S.A. to the P. Canal. Commercial aviation has developed rapidly in P. Daily air services, in both directions, connect P. city and David. Daily air-mail and passenger services operate between P. and New York. There are telegraph cables from P. to N. and S. Amer. ports, from Colón to the U.S.A. and Europe. The Pacific ports are Puerto Mutil, Pedregal, Dulce, Montijo, and Puerto Armuelles; the Atlantic ports are Puerto Bello, Bocas del Toro, and Colón. There are 60 radio stations.

**Defence.** P. supports no army or navy, but during the Second World War a militia force was formed with the assistance of U.S. officers. In 1941 P. granted air and anti-aircraft bases to the U.S.A. for the defence of the Canal Zone.

See W. R. Scott, *The Americans in Panama*, 1912; A. Edwards, *Panama: the Canal, the Country, and the People* (revised ed.), 1914; A. H. Verrill, *Panama Past and Present*, 1921; C. H. Forbes-Lindsay, *Panama and the Canal To-day*, 1926; H. G. Miller, *The Isthmian Highway: a Review of the Problems of the Caribbean*, 1926; W. D. McCain, *The United States and the Republic of*



*Panama, 1937*; L. O. Ealy, *The Republic of Panama in World Affairs, 1951*; J. and U. Biesanz, *The People of Panama, 1955*.

**Panama**, cap. of the rep. of P. The original town was founded by the Spaniard, Pedrarias de Avila, who in 1514 amalgamated the sev. Sp. colonies in Central America under the name of Tierra Firme and about 5 years later founded P. city. This city was sacked and burnt by the famous Eng. buccancer, Henry Morgan (q.v.), in 1671 and rebuilt in 1673 during the governorship of Fernández de Córdoba on a site 4 m. WSW. of the previous site. The modern city is thus to the E. of Ancón, and has developed new suburbs to its S. and N. According to Esquemeling, the original P. was a city of wealth and luxury of 30,000 inhab. with some 5000 stone houses and thousands of large houses of cedar. P. city stands on a rocky peninsula at the foot of an extinct volcano known as Ancón Hill and is on the S. side of the isthmus at the head of the Gulf or Bay of P. Since the rep. gained her independence the cap. has undergone many improvements, and the \$10,000,000 paid by America for the lease of the canal has enabled the Panamanian Gov. to erect a number of handsome buildings, which have much altered the aspect of the old city. The main thoroughfare is the Avenida Central. The weather-worn cathedral (founded in 1760) took nearly 90 years to complete. It was erected at the expense of a Negro, who from lowly origin rose to be Bishop of P. Its chief features are the twin towers, the domes of which are encased in mother-of-pearl, said to have been brought from the pearl fisheries of Margarita. Among the other churches are San Felipe Neri, with an arch dated 1888, and San Francisco, built in 1740. Facing the cathedral are the episcopal palace and old Gov. Palace. Among the new buildings one of the most noteworthy is the handsome Palacio Municipal or city hall. At the lower end of the Avenida is the group of gov. buildings, at the back of which is the handsome National Theatre, one of the finest buildings of the kind in this part of the world. The Malecón, or sea-wall, is a popular promenade; to the W. of it is another sea-wall, that of Las Bóvedas, under which are the old prisons. At the foot of Ancón Hill is the Instituto Nacional, P.'s first univ., which was opened in 1911. Pop. 127,874. See J. Esquemeling, *Buccaniers of America*, trans. from the Dutch by Wm Crooke (London), 1684 (Esquemeling or Oexmalin was a buccancer with Morgan, and his book is the only first-hand source of all the facts pub. in the Calendar State Papers and used by biographers since); A. H. Verrill, *Panama Past and Present*, 1921.

**Panama**, Gulf of, inlet of the Pacific Ocean, formed by a curve of the isthmus, contains the Pearl Is. with their fisheries. Width 120 m., from Point Caracoles on E. to Point Mala on W.

**Panama**, Isthmus of, joins N. and S. America. Lat. 9° N. long. 79° 30' W.; length, 480 m.; breadth, 37-110 m. Its

E. end separates the gulfs of P. (Pacific) and Darién (Atlantic).

**Panama Canal**, designed in 1879 by Ferdinand de Lesseps (q.v.), who constructed the Suez Canal, as a tide-level canal. Gomera (1510-60) advocated a canal; in the 16th cent. the Panama, Nicaragua, and Tehuantepec routes were discussed. A Colombian concession granted to Lt. Wyse was sold to the Panama Canal Company, and work of survey, etc., was commenced in 1881. The estimate of cost was about £33m. reduced by de Lesseps to £24m., and the work was to be completed in 1888. With less than one-quarter the work done and £74m. estimated debt, the company was forced into liquidation in 1889. In 1892-3 occurred the Panama scandals in France, leading to the imprisonment of de Lesseps, his son Charles, and others; mismanagement, bribery, corruption, and fever had ruined the scheme. Up to 1902 £60m. had been expended, only £12m. effectively. The chiefs of the Fr. canal company, convinced that they were unable to complete the work, commenced negotiations with the U.S. and Colombian Govs. The U.S. offer of £8m. for the company's rights and assets was accepted by the Herrán-Hay Treaty (1903). This treaty was strongly opposed by Colombia, and its ultimate rejection led to Panama proclaiming her independence in 1903, and signing the Canal Treaty in Nov. of the same year (see PANAMA CANAL ZONE), under which the work progressed. The necessity of the work was brought home to the U.S.A. by the voyage of the S.S. *Oregon* from San Francisco to Cuba in the Sp.-Amer. war, the ship having to sail round Cape Horn. When the U.S.A. eventually made arrangements to dig the canal, it paid the rep. of Panama a bonus of \$10m., the Fr. canal company \$40m. In 1925, mainly to obtain the goodwill of the S. Amer. republics, it paid Colombia \$25m. Work on the canal was finally started by the Americans in 1905, and in 1920 President Wilson declared it formally completed. The digging of the canal was made possible by the work of Wm C. Gorgas, then a surgeon in the U.S. Army, who, with 2000 assistants, removed the sources of yellow fever and malaria, and made the Canal Zone as healthy as any place in the U.S.A. The engineering work was entrusted to George W. Goethals (q.v.), then a colonel in the engineering corps of the U.S. Army. Actual excavation work was begun in 1906, with a force of 45,000 men. The clerks, foremen, and officials were Americans, but the manual labour was mainly performed by Spaniards, Italians, and Negroes. Huge steam shovels were employed, the soil being hauled off by about 800 trains of 23 cars each. A total of 240,000,000 cub. yds of earth was removed. The canal cost \$366,650,000, exclusive of appropriations for its defence.

It lies between the 8th and 10th parallels of N. lat. and the 79th and 80th meridians W. long. It connects the Caribbean Sea with the Pacific Ocean. It runs from NW. to SE. almost at right

angles to the axis of the isthmus. The Canal Zone, which belongs to the U.S.A., includes all land extending 5 m. on either side of the centre line of the canal channels. By the terms of the treaty the cities of Colón on the Atlantic side and Panama on the Pacific are retained by the rep. of Panama, but the U.S.A. makes itself responsible for their hygienic condition. The total area of the Canal Zone is 558.56 sq. m., including Gatun Lake, with 163.38 sq. m., and Miraflores Lake, with 1.90 sq. m. In passing through the canal from the Atlantic to the Pacific a vessel goes through a dredged channel at least 300 ft wide, 41 ft deep at mean low water, and 5.77 m. long, leading to the Gatun locks, the first of a series of 3 locks. The Gatun locks, which consist of 3 flights of chambers, raise the vessel from sea-level to Gatun Lake, a lift of 85 ft. The locks are double, being 1.04 m. long and 110 ft wide. Each chamber is 1000 ft long, with intermediary gates which can shorten the length for smaller vessels and thus conserve water. All lift operations are controlled from a central station. The ship is attached to electrically operated mules which run on tracks on both sides, pulling the ship through and keeping it in position, so that it will not damage itself or the mechanism of the locks. Once out of the locks, the vessel proceeds under its own steam through a fixed channel in Gatun Lake. This varies from 500 to 1000 ft wide and from 45 to 85 ft deep. It does not follow a straight line through the lake, but goes through the former valley of the Chagres R., whose waters were used to form the lake. Once out of the lake, the vessel enters Culebra Cut (now Gaillard Cut), a distance of 20.55 m. from Gatun locks. This cut is 300 ft wide, 45 ft deep, and 6.97 m. long. At the Pacific end of this cut the ship passes through Pedro Miguel locks, a single flight of double chambers. This flight of locks is 0.75 m. long with a drop of 31 ft to the level of Miraflores Lake. Passing through this lake is a fixed channel 500 ft wide, 45 ft deep, and 0.86 m. long. The ship then enters Miraflores locks, consisting of 2 flights of double locks 0.91 m. long with a drop of 54 ft more or less, depending on the state of the tide, and thus reaches the level of the Pacific Ocean. The channel from Miraflores locks to the Pacific is 500 ft wide, 35 ft deep, and 6.99 m. long. In 1940 construction was begun on a new set of locks located approximately parallel to those at Gatun, Pedro Miguel, and Miraflores. A concrete dam, 974 ft long and 223 ft high, across the Chagres R. at Alajuela was completed in 1935, creating Madden Lake, thus providing a reserve of 22 milliard cub. ft of water for maintaining the level of Gatun Lake in dry seasons. The average time of passage through the canal is from 7 to 8 hrs; the record passage is 4 hrs 10 min. The total length of the canal from entrance to entrance is 43.85 nautical m. The ports of entry for the Canal Zone are Cristóbal on the Atlantic side and Balboa on the Pacific. The maximum traffic capacity of the canal is

estimated at 48 ships of usual size in a day, or about 17,000 in a year. By a treaty of 1955 between the U.S.A. and Panama, the U.S.A. increased its ann. annuity for the use of Panamanian ter. to \$1,930,000. and agreed to return to Panama some \$24,000,000 worth of land no longer needed for operating the canal; certain other concessions were arranged between the signatories. In the fiscal year 1956 some 8200 ocean-going vessels passed through the P. C. (net tonnage over 41,000,000). All ships passing through the canal have to pay the tolls except the gov. ships of the reps. of U.S.A., Panama, and Colombia. See P. Bunan-Varilla, *Panama: its Creation, Destruction, and Resurrection*, 1913, and *The Great Adventure of Panama*, 1920; F. J. Haskin, *The Panama Canal*, 1914; D. H. Smith, *The Panama Canal*, 1927; D. C. Miner, *The Fight for the Panama Route: the Story of the Spooner Act and the Hay-Herrán Treaty*, 1940; N. J. Padelford, *The Panama Canal in Peace and War*, 1942; and G. Mark, *The Land Divided: a History of the Panama Canal*, 1944.

**Panama Canal Zone**, strip of land some 5 m. wide, on both sides of the centre line of the Panama Canal, granted to the U.S.A. by the treaty of 18 Nov. 1903 with Panama. In the treaty Panama granted to the U.S.A. the use in perpetuity of the zone and, within its ambit, the exclusive control for police, judicial, and sanitary purposes. A new treaty, ratified by Panama and the U.S.A. in 1955 (see PANAMA CANAL), altered arrangements made under previous treaties. The zone is 558.56 sq. m. in area, and of this area 163.38 sq. m. are occupied by Gatun Lake. The zone also includes about 20 sq. m. in the Chagres R. valley above Alajuela, assigned to the U.S.A. in 1924, with the view of constructing Madden Dam at Alajuela. The pop. of the zone is 52,822. There is no privately owned land in the zone, the zone being gov. property, dedicated to the purpose of protecting, operating, and maintaining the canal; but steamship companies may obtain building sites on licence, and agric. land can be licensed in limited tracts. The cities of Panama and Colón remain within the jurisdiction of Panama, but the U.S. Gov. is by the treaty given the control over both cities and over their harbours in matters relating to sanitation and quarantine. The status of the zone is that of a military reservation under the governor of the Panama Canal, who is appointed by the U.S. Gov. In Sept. 1939 the President of the U.S.A. placed the canal and zone under the control of the U.S. Army, and in Jan. 1942 he estab. Amer. naval control over the Gulf of Panama and the approaches to Cristóbal. Control over the Trans-Isthmian Highway was transferred to Panama in 1950.

**Panarea**, see LIPARI ISLANDS.

**Panathenaea**, most famous of Athenian festivals, celebrated in honour of Athena, the patron deity of Athens. Originally the Athenaea, it was said to have been called P. when Theseus united the inhab. of Attica into one body. Supposed to

have been founded by Erechtheus as a religious ceremony, it afterwards included horse races, chariot races, and gymnastic sports, as well as torch races and musical contests (introduced by Pericles). It consisted of 2 feasts, the lesser P. and the greater P., the former celebrated every year and the latter every fourth year. The great P. occupied some days, culminating on the twenty-eighth day of August, the birthday of the goddess, when the grand procession carried through the city the costly embroidered peplos or state robe of Athena. This procession is vividly represented in the frieze of the Parthenon which is now in the Brit. Museum.

**Panax**, genus of shrubs and trees (family *Araliaceae*) with ornamental pinnate or digitate leaves, and umbels of cream, green, or white flowers. *P. quinquefolius* is Ginseng (q.v.).

**Panay**, is. of the Philippines, bounded on the W. by the Cuyo East Pass and on the E. by the Visayan Sea. It has an area of 4446 sq. m., and is mountainous and well watered. The chief industry is agriculture, coconuts, citrus fruits, rice, sugar, and tobacco being the chief crops. Copper is mined, and horses raised. Jap. forces occupied P. from May 1942 until March 1945. Iloilo (pop. 110,122) is the largest tn. Pop. of is. 1,291,548.

**Pancha Tantra**, or **Panchatantra**, anct collection of Indian fables going back to the 4th cent. See also **BTDPAI**.

**Panchayat**, traditionally, in India, the court or committee of vil. elders which managed vil. affairs. Under Brit. rule it became the lowest centre of authority, with very limited powers and functions and even more limited finance. It remains the source of authority in many vil. social affairs.

**Panchoen Lama**, see **LAMAISM**.

**Panchromatic**, see **PHOTOGRAPHY**.

**Pancras**, Saint, Phrygian Christian who was martyred in Rome at the age of 14. The date of his martyrdom is uncertain. He was buried in the cemetery of Calpodius in Rome, and his head is preserved in the Lateran Basilica. His cultus was very widespread in Europe in the Middle Ages. Pope St Vitalian in the 7th cent. sent relics of the saint to one of the A.-S. kings, and thenceforward St P. became very popular in England. His feast is kept on 12 May.

**Pancratium**, see **BOXING**.

**Pancreas**, long, narrow, racemose gland composed of 2 kinds of tissue. In man the P. lies behind the stomach, the larger end lying within the bend of the duodenum, and the narrow end in contact with the spleen. The cells of one kind of tissue are similar to those of the parotid gland and secrete the pancreatic juice containing trypsin, which converts proteids into amino-acids such as leucine and tyrosine; a ferment amyllopsin, similar to ptyalin, which converts starch into sugar, chiefly maltose, but partly dextrose (glucose); and a ferment, lipase, which saponifies and emulsifies the fats. These digestive juices are poured into the duodenum at the middle bend, together

with the bile; they are viscid and alkaline, due to the presence of sodium carbonate. The cells of the second kind of tissue form the is. of Langerhans, and their secretion contains insulin (from Lat. *insula*, an is.) which is important in carbohydrate metabolism (see also **DIABETES**). If the P. be removed, the amount of sugar in the blood increases, and some is excreted in the urine, as in diabetes mellitus, a disease in which the carbohydrate metabolism is disturbed. If the pancreatic duct be severed from the duodenum and exposed so that pancreatic juice is liberated, external to the body, carbohydrate metabolism remains normal. This is evidence of the control of this metabolism by an internal secretion of the P., which thus functions as an endocrine organ as well as a digestive gland. The function of the cells of the is. of Langerhans may be impaired or even destroyed by lesions, fibrosis, and degeneration, but in some cases of diabetes mellitus no visible change in these cells takes place (see **DIABETES**; **GLAND**; **INSULIN**).

**Pancreatitis**. Inflammation of the P. usually proceeds from the ducts, and is sometimes associated with catarrh of the stomach, bile ducts, and duodenum, and with the formation of gall stones. The chronic form is accompanied by fever, loss of weight, anaemia, abdominal pains, jaundice, large pale stools, sugar in the urine, and the pancreatic reaction. It is characterised by glandular atrophy and growth of connective tissue. Acute pancreatitis shows much more violent symptoms; with collapse, nausea, and vomiting, sudden acute colic in the upper abdomen, and a tense and swollen condition of that part, and fever. It is of 3 types: (1) haemorrhagic, (2) gangrenous, (3) suppurative, with abscess formation; fat necrosis is observed in the substance and surface of the gland. The gangrenous form is regarded as an advanced stage of the haemorrhagic form and results from the infection of the P. by bacteria which disintegrate the tissues.

**Panda**, or **Bear-cat** (*Ailuurus fulgens*), mammal of the family *Ailuridae* and almost exclusively vegetarian. It is found only at a height of about 10,000 ft in the SH. Himalayas. Its total length is about 30 in. The thick fur is rich chestnut or rusty red on the upper parts and black on the limbs and under part. The face has white markings, and the long, bushy tail bears a series of indistinct reddish-brown rings. The feet have large semi-retractile claws, and the animal applies nearly the whole of the sole of the foot to the ground in progression. The Giant P. (*Ailuropoda melanoleuca*, is allied to the bears; it is a rare animal of E. Tibet, where it was discovered by Père David. Five Giant P.s brought to England from W. China by Mr Floyd Smith in 1938 were the first P.s ever to reach England alive. One went to the Continent, another to New York, and 3 to the London Zoo. Ming, the sole survivor in 1944 of the 5, d. in the London Zoo on 25 December, 1944. Valued at £2000, she was the rarest and most

valuable animal in the gardens. Little is known about the giant *P.* in its natural state, beyond the fact that bamboo leaves are its natural food.



Zoological Society of London  
GIANT PANDA

*Pandanus*, genus of evergreen tropical shrubs and trees, with simple, narrow, strap-like leaves which are often variegated, and dioecious flowers, followed by globular or oblong fruits. *P. candellabrum*, the Candelabrum or Chandelier Tree, *P. tectorius* (synonym *odoratissimus*) with strongly scented inflorescence, *P. lindenii*, and others are grown as pot plants or under stove-house conditions in Britain, and are known as Screw-pines.

**Pandects**, see JUSTINIANUS, FLAVIUS ANICIUS.

**Pandemic**, see EPIDEMIC.

**Pandharpur**, tn of Bombay state, India, on the Bhima, 38 m. from Sholapur. It is a popular pilgrims' resort, containing a famous temple to Vishnu.

**Pando**, dept of NW. Bolivia, adjoining Brazil, a low-lying area between the Abuná and Acre R.s. Cobiá is the cap. *P.* is noted for rubber and other tropical products. Area 23,876 sq. m.; pop. 19,800.

**Pandora**, in Gk mythology, name of the first woman. Zeus, in vengeance upon Prometheus, who had stolen fire from heaven, caused a woman to be made, who, by her charms and beauty, should bring misery upon the human race. The gods blessed her and called her *P.* or 'All-gifted.' She brought from heaven a box containing every human ill which she was forbidden to open. Curiosity made her do so, whereupon they all escaped and spread over the earth. Hope alone remaining. Later the box was said to have contained blessings which flew away when it was opened. See Hesiod, *Works and Days*, lxxxi, seq.; Milton, *Paradise Lost*, iv. 716 ff.

**Pandulf** (d. 1226), Bishop of Norwich, b. Rome. He was sent as papal legate to England in 1211 and 1213 to negotiate with King John, and was also present at the conference of Runnymede in 1215. He received the see of Norwich in 1218, and until 1221 had almost regal authority.

**Panæas**, see BANTAS and CAESAREA.

**Panegyric** (Gk *pan*, all; *agora*, assembly) originally meant a 'festival speech,' such as that in which Isocrates urged the Greeks to unite against Persia. The term then came to mean a public eulogy, such as the earlier funeral oration of Pericles (q.v.) over the Athenians who fell in the Peloponnesian War. A famous panegyric of Roman times, that of Pliny the Younger on the Emperor Trajan, was the first of a series of adulatory speeches addressed to reigning emperors and collected as the *Panegyrici Latini*. In modern times the term is used for a formal or elaborate eulogy in a public speech or public writing. A notable example is the tribute paid to England by John of Gaunt in his great speech in Shakespeare's *Richard II*.

**Panel Beating**, process used in sheet-metal work, to shape the sheet metal for duct work and trunking. Accuracy is essential, especially in the assembly processes, such as welding, when heat tends to distort the lines. Machine fabrication is rapidly taking the place of hand-work.

**Panel Heating**, system of low-temp. heating in which small pipes are placed below the surface of walls and ceilings, or beneath flooring, and hot water circulates through them at a temp. of from 70° to 130° F. For complete safety, *P. H.* should be thermostatically controlled. The term is used also to describe a similar form of low-temp. heating by electricity. See also HEATING.

**Panel Walls** fill the spaces between the vertical and horizontal framing members of a structure. They need to possess all the qualities of other types of external walls (q.v.), except that they do not have to carry imposed vertical loads. They may therefore be light in weight, and are usually of sandwich or cavity construction.

**Panelling**, covering of a surface in a building, such as a door, ceiling, or wall, with panels, i.e. sunken or raised compartments, usually framed at the edges. They may be of stone, plaster, or wood. Ceiling plaster panels, often most ornately moulded, were a common form of interior decoration from the 16th to the 19th cents., while Wren popularised for a time the use of stone and marble *P.*, much favoured by It. Renaissance craftsmen. Wood has been a favourite material for *P.* since the late Middle Ages. As a type of mural decoration, wood-*P.* was first used in England in the 15th cent., solid wood being used. The joiner working in solid wood had always to allow for the limitations placed upon his work by his material. Both the design and construction of *P.* were determined by the nature of the wood. In Tudor times panels were small and unjointed, set in a close framework of stiles and rails, which were all grooved. The panels were set in dry, to minimise subsequent shrinkage. In the 17th cent., when soft woods and scantlings appeared, the design changed to allow for the introduction of large panels, developing into the long Palladian oblong, bolder and simpler mouldings replacing

the elaborate detail of earlier times. The influence of Robert Adam reduced the 18th-cent. P. to more modest proportions; plain white or cream paint became the chief decoration on P., and the moulding was even simpler. But throughout the method of construction remained essentially the same: that of a framework grooved and rabbeted to conceal the unavoidable movement in the panels, so that, at worst, it was only necessary to paint or polish the margin that shrinkage would expose along the arris on the stile or rail framing the panel. In modern times, however, the development of plywood (q.v.) has led to entirely new methods of construction, and, because of its lower costs, to a much wider use of P. Plywood boards in Galoon mahogany are now mass-produced at a size of 65 in. by 183 in., so that very large plywood panels are frequently used. The shrinkage in plywood is negligible; the designer's chief concern is therefore the concealment of butt and heading joints, since the minutest crack produced by such joints would otherwise be visible on the polished surface given by modern veneering (q.v.), which is the most popular form of panel finishing to-day.

**Pangani**, tn, dist., and riv. of Tanganyika on the Indian Ocean. The tn, 32 m. S. of Tanga, is on the riv. (which is called Ruvu near the mouth). Much of its former importance has been lost. Sisal, coconuts, and sugar are grown in the dist.

**Pange Lingua**, opening words, used as the name of famous hymns. The earlier, *Pange lingua gloriosi proelium certaminis*, treats of the Passion of Christ, and is ascribed to Venantius Fortunatus, and by some to Claudian Mamertus (5th cent.). It is in the accented unrhymed verse of the period. The other and more popular hymn, *Pange lingua gloriosi corporis mysterium*, treats of the Eucharist and was written by St Thomas Aquinas (13th cent.). It is in rhymed verse and is notable for its theological precision as well as its triumphant swing, which is imitated from the earlier hymn. There are also lesser-known hymns beginning P. L.

**Pangeneses**, see HEBREITY.

**Pangim**, see (61).

**Pangkor**, or **Pankur**, see DINDING.

**Pangolin**, or **Scaly Ant-eater**, order of (toothless) mammals, (Pholidota) found in Africa, India, Ceylon, Java, Borneo, China, and Formosa. There are about 7 species. They are lizard-like in appearance, and, with the exception of the muzzle, sides of the head, throat, chest, and belly, are covered with scales, these being formed of consolidated bairs. They vary in length, according to species, from 1 to 3 ft, exclusive of the prehensile tail, which is about twice as long as the body. The head is small, with a tapering muzzle. The lower gums of the mouth form 2 thickened horny ridges separated by a groove along which the cylindrical worm-like tongue slips in and out. The feet are strongly clawed, especially on the third toe of the forefoot, which is used in burrowing and in climbing. The extreme

tip of the tail is free from scales and padded with thick skin. The protection afforded these animals by their scales is supplemented by a powerful stench emitted by the entire surface of the skin. The single family (Manidae), may be divided into 2 groups, distinguished both by geographical distribution and certain convenient but not very important external characteristics. In the first or Asiatic group are 3 species: *Manis javanica*, ranging from Burma through Java to Borneo; *M. aurita*, found in China, Formosa, and Nepal; and *M. crassicaudata* or the common Indian P. found over the whole of India and Ceylon. In the African group are the long-tailed P. (*Phataginus macrura*), which has a tail nearly as long as its body; the white-bellied P. (*P. tricuspis*), the short-tailed



P. (*Smutsia temminckii*), and the giant P. (*S. gigantea*)—both the last 2 species have their tails covered entirely with scales. Two specimens of Temminck's (named from Konrad Jacob Temminck, 1778-1837, one-time keeper of the Leyden museum of natural hist.) P., which is confined to the savannah regions of E. Africa, were received by the Zoological Gardens in July 1949. Temminck's P. is a terrestrial species, as is also the giant P., unlike the 2 W. African species *P. macrura* and *P. tricuspis*, which are arboreal. It grows about as big as a medium-sized pig and has a much broader and shorter tail than the other species. With its bony overlapping scales, which protect it against carnivorous animals, the P. is probably quite safe from them when it rolls up into a ball. Its natural food consists of ants and termites; but the terrestrial species is much easier to feed than is the arboreal, which seem almost impossible to keep in captivity. The young P.s are carried about on the mother's tail.

**'Panhandle State,'** see WEST VIRGINIA. **Panicum**, genus of grasses which includes 2 Brit. species and a large number of tropical ones, the most important of which is *P. miliaceum*, millet (q.v.).

**Panipat**, tn of E. Punjab State, India, 85 m. N. of Delhi. P. is best known as the scene of 3 important battles. The first was in 1526, when Babur defeated Ibrahim Lodi and became master of Delhi. The second was in 1556, when Akbar defeated the Pathan Sur army. The third was in 1761, when Ahmad Shah Durani of Afghanistan inflicted a crushing defeat upon the main Mahratta army.

**Panizzi**, Sir Anthony (Antonio) (1797-1879), prin. librarian of the Brit. Museum (q.v.), b. Brescello, Italy. In 1822, having conspired against the gov., he fled to England. Here he made many acquaintances, including Brougham, who secured him, in 1831, an assistant-librarianship at the Brit. Museum. He became keeper of printed books in 1837 and prin. librarian in 1857. He was in the first place responsible for the catalogue of books, and was the originator of the great domed reading-room. He was created K.C.B. in 1869. The services he rendered to students in connection with the organisation of the library have been universally recognised. The library, however, was not his only interest, for he was a keen politician, and used all his influence to further the cause of the liberation of Italy. See C. Brooks, *Antonio Panizzi, Scholar and Patriot*, 1931.

**Pankhurst**, Emmeline (1858-1928), feminist leader, b. Manchester, daughter of Robert Goulden, calico-printer and early advocate of woman-suffrage. At 13 she went to school in Paris, and made friends with the daughter of Henri Rochfort. In 1879 she married Richard Marsden P., lawyer, and they served on the committee that promoted the Married Women's Property Act. Five years a Manchester Poor Law Guardian, in 1892 she left the Liberals and joined the Independent Labour party. Widowed in 1898, she became registrar of births and deaths at Chorlton-on-Medlock, forming the Women's Social and Political Union in 1903. From 1906, as a 'militant,' she was frequently arrested, and in 1913 sentenced, in connection with the blowing-up of Lloyd George's house at Walton, to 3 years' penal servitude. When the First World War broke out Mrs P. went recruiting in the U.S.A. and visited Russia in 1917. She joined the Conservative party in 1918. Her statue was erected in Victoria Tower Gardens, London. She pub. *My Own Story*, 1914. See Sylvia Pankhurst, *The Life of Emmeline Pankhurst*, 1935.

Her daughter Sylvia Estelle P. (b. 1882) was also a member of the suffrage movement, and in 1921 received 6 months' imprisonment for seditious pubs. She also worked for Abyssinian independence. Her works include *The Suffragette Movement*, 1931, and a life of her mother, 1935. Another daughter, Christabel (1880-1958), was a worker in her mother's cause, after 1918 devoting herself to a religious movement; in 1936 she was created D.B.E.

**Panmunjom**, vil. of the rep. of Korea (q.v.), 6 m. E. of Kaessong (in N. Korea). During 1951-2 truce negotiations took

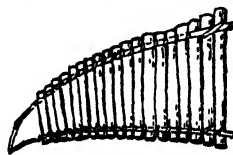
place at P. between the U.N. and the 'communists' (see KOREAN WAR).

**Pannel** is the term used in Scots Criminal Law equivalent to the English 'prisoner at the bar.'

**Pannonia**, Rom. prov. From 11 bc until ad 9 it was part of Illyricum, but was then made a separate prov. Trajan formed it into 2, P. Superior and P. Inferior, which were in turn subdivided by Diocletian. By the beginning of the 5th cent. the whole area had been virtually abandoned in face of barbarian invasion.

**Panorama**, originally constructed by Robert Barker, an Irish artist (1739-1806) living in Edinburgh, who exhibited a water-colour picture of Edinburgh (1788) on a cylindrical canvas 25 ft in diameter. The name applies to such pictures and to those revolving on cylinders. The *diorama* is a variation invented by Daguerre and Bouton, viewed by direct and reflected light, and giving a more glowing effect. Barker showed a P. of 90 ft in diameter in a specially built room in London (1793). Thomas Girtin's last work was a panorama of London (1802). Robert Fulton in 1797 carried the idea to Paris, and P.s became popular on the Continent. Prevost painted 'Tilsit,' viewed at Montmartre by Napoleon (1810). Battle pictures by Langlois of 'Navarino,' 'Moscow,' 'Pyramids,' and 'Malakoff' were exhibited at the Champs Elysées. The 'Siege of Paris' and P.s of the Franco-Ger. war were shown in the 2 countries. Scenes of the civil war in the U.S.A., Niagara (1890), and Jerusalem (1891) were exhibited in London.

**Panormus**, see PALERMO.



PANDEAN PIPES

**Panpipes**, **Pandean Pipes**, or **Syrinx**, early form of musical instrument, consisting of a series of reeds or pipes of graduated length fastened together, which when blown across produced the different notes of the scale. It still survives in some countries, but is of no artistic value in composition, the nearest approach being Mozart's use of an instrument of the type playing 5 notes from G to D in *The Magic Flute*.

**Pansy**, or **Heart's-ease** (*Viola tricolor*), dainty Brit. plant, common on arable land, and wholly or in part the origin of the numerous and beautiful garden varieties which have all been introduced since the beginning of the 19th cent. Violas or tufted P.s are partly derived from *V. cornuta* of the Pyrenees. The production of flowers is encouraged by

removing faded flower heads. Propagation is usually by cuttings or division of plants. See VIOLA.

**Pantagraph**, see PANTOGRAPH.

**Pantagruel**, see RABELAIS.

**Pantaleon, Jacques**, see URBAN (popes), Urban IV.

**Pantelleria** (anc. Kossyra), volcanic is., belonging to Italy, lying in the Mediterranean, 80 m. SW. of Sicily (q.v.). The mt slopes are forested, and vines, olives, and sub-tropical fruits are grown. Sheep are reared in the valleys. The cap. is P. (pop. 10,700) on the NW. coast. Area 32 sq. m. During the Second World War, P., though strongly fortified, did not long hold out against allied attacks delivered in 1943 simultaneously with the final conquest of Tunisia. Initial attacks were by forces of fighters and light and medium bombers (May). On 7 June Wellingtons and Flying Fortresses reinforced a daylight assault and a naval blockade. Cruisers and destroyers bombarded the is. sev. times between 30 May and 8 June. Though isolated by that time, the exhausted garrison refused to surrender. Air attack was then redoubled, and on 10 June there were over 1500 sorties of planes which dropped the same number of tons of bombs. Next day a powerful force of cruisers and destroyers began a bombardment, quickly followed by another great air raid, while at midday the troops put off in assault craft towards the shore. The It. commander then surrendered. Under the 1947 peace treaty P. was to be demilitarised.

**Panter-Downes, Mollie Patricia** (1906–), novelist, b. London. She was educ. at Heathfield House, Horsham, and when she was 17 had her first novel, *A Shoreless Sea*, pub. In 1927 she married Clare Robinson. Among her other novels are *The Chase*, 1925, *Storm Bird*, 1929, *My Husband Simon*, 1931, *Nothing in Common but Sex*, 1932, and *One Fine Day*, 1947. During and after the Second World War she wrote a weekly 'Letter from England' for the *New Yorker*.

**Pantheism** (Gk *pan*, all, and *theos*, God), name given to that system of speculation which, in its spiritual form, identifies the universe with God (and therefore may be called *akosmism*) and, in its more material form, God with the universe. It is only the latter kind of P. that is logically open to the accusation of atheism; the former has often been the expression of a profound and mystic religion. The antiquity of P. is undoubtedly great, for it is prevalent in the Hindu civilisation, the oldest known. Yet it is a later development of thought than Polytheism, the natural instinctive creed of primitive races; and most probably it originated in the attempt to divest the popular system of its grosser features, and to give it a form that would satisfy the requirements of philosophical speculation. Hindu P. or *akosmism* is taught especially by the Upanishads, by the Vedānta and Yoga philosophies, and by those poetical works which embody the doctrines of these systems, for instance, the Bhagavad Gītā, which follows the Yoga doctrine. Hindu

P. is purely spiritual in its character; matter and (finite) mind are both alike absorbed in the fathomless abyss of illimitable and absolute being. Gk P. originated in the same way as that of India. The philosophy of Anaximander the Milesian (610-c. 546 bc) may be described as a system of atheistic physics or of materialistic P. Its leading idea is, that from the infinite or indeterminate, which is 'one yet all,' proceed the entire phenomena of the universe, and to it they return. Xenophanes of Colophon (fl. 520 bc) is the first classical thinker who promulgated the higher or idealistic form of P.—casting his eyes wistfully upon the whole heaven, he pronounced that unity be to God. It is often extremely difficult, if not impossible, to draw or to see the distinction between the P. of the earlier Gk philosophers and sheer atheism. But the most decided and the most spiritual representatives of this philosophy were the 'Alexandrian' Neoplatonists, in whom we see clearly, for the first time, the influence of the E. upon Gk thought. The doctrines of Emanation, of Ecstasy, expounded by Plotinus (AD 204–70) and Proclus (410–85), no less than the fantastic Daemonism of Iamblichus (d. c. 330), point to Persia and India as their bp. During the Middle Ages speculation was guided by the Church, and we hear little of P. The scholastic system, culminating in the synthesis of St Thomas Aquinas, necessarily excluded P. as repugnant to the simplicity and transcendence of God. Almost the only philosopher of this period who tended towards pantheistic views is John Scotus Erigena (c. 817–c. 877), who is regarded as the only link between anc. and modern P. Modern P. first shows itself in Giordano Bruno, burned at Rome for his opinions in 1600. The universe in his eyes is, properly speaking, not a creation, but only an emanation of the infinite mind. Spinoza comes next among pantheists; his system is based, like the geometry of Euclid, on certain definitions and axioms, and he claims to have given it as conclusive and mathematical a demonstration as the latter. The prin. result at which, after a long, firm-linked chain of reasoning, Spinoza arrives is that there is but one substance, infinite, self-existent, eternal, necessary, simple, and indivisible, of which all elements are but modes. This substance is the self-existent God. In Germany, with the exception of Kant, the 3 greatest philosophers of recent times—Fichte, Schelling, and Hegel—have all promulgated systems of a thoroughly pantheistic and ideal character. Neither England, France, nor America has produced a single great pantheistic philosopher, but there is an immense amount of vague pantheistic sentiment in the poetry, criticism, theology, and even in the speculative thinking, in these and all European countries in the present age. This is attributable to the ravages made by a now discredited biblical criticism, and the impact of the physical sciences on religious beliefs. In fact, however, there is no real conflict

between natural science and supernatural religion; and P. in any shape or form is contrary to Christian faith. See also METAPHYSICS; MONISM. See G. Weisenborn, *Vorlesung über Pantheismus und Theismus*, 1859; C. E. Plumtre, *The History of Pantheism*, 1878; F. Paulsen, *Der moderne Pantheismus und die christliche Weltanschauung*, 1906; and J. A. Picton, *Pantheism*, 1914.

**Pantheon** (from Gk *pantheon*, temple to all the gods), temple erected at Rome in c. AD 120 by Hadrian to replace the previous P. of Agrippa (erected 27 BC), which had been destroyed by lightning. It is the best preserved and noblest specimen of Rom. architecture (q.v.). It is now used as a Christian church. See also PARIS.

**Panther**, see LEOPARD and PUMA.

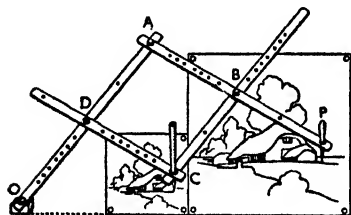
**Panther-cat**, see OCKLOT.

**Pantholops**, see CHIRU.

**Panticapaeum**, anct name of Kerch (q.v.).

**Pantin**, Fr tn in the dept of Seine, a NE. suburb of Paris, on the Ourcq canal. It has chemical and glass manufs., and sugar refineries. Pop. 36,000.

**Pantograph**, instrument used for making exact copies of a plan or drawing on a larger or smaller scale. The commonest form is made as follows. Four rods are joined together as in figure at points A, B, C, and D, so that ABCD forms a parallelogram, and so that OD = DC and OB = BP. The instrument is pivoted at O, there is a tracing point at P, and a pencil



PANTOGRAPH

at C. The tracing point is then moved over the drawing to be copied, and by the pencil at C a smaller reproduction of the drawing is made at the same time. If the drawing is to be enlarged, the tracing point is placed at C and the pencil at P. Since the points D and B can be moved up and down the rods at pleasure, all positions can be arranged for.

**Pantomime**, among the anct Romans, denoted not a spectacle but a person. The P.s were a class of actors who acted their parts only in dumb show. The date of their first appearance in Rome cannot be ascertained; probably the *histriones* brought from Etruria to Rome in 364 BC were P.s, but the name does not once occur during the rep., though it is common enough from the very dawn of the empire. Augustus showed great favour

to this class of performers, and is consequently supposed by some writers to have been himself the inventor of the art of dumb acting. The class soon spread over all Italy and the provs., and became so popular with the Rom. nobles and knights that Tiberius reckoned it necessary to administer a check to their vanity by issuing a decree forbidding the aristocracy to frequent their houses, or to be seen walking with them in the streets. Under Caligula they were again received into the imperial favour, and Nero himself acted as a P. From this period they enjoyed uninterrupted popularity as long as paganism held sway in the empire. As the P.s wore masks, no facial mimicry was possible; everything depended on the movements of the body, and it was the hands and fingers chiefly that spoke. The subjects thus represented in dumb show were always mythological, and consequently fairly well known to the spectators. The dress of the actors was made to reveal, and not to conceal, the beauties of their person, and as, after the 2nd cent., women began to appear in public as P.s, the effect of the aesthetical costume was conducive to humorality; sometimes these pantomimic actresses appeared quite naked before an audience. It was natural, therefore, that pantomimic exhibitions should have been denounced by the early Christian writers, as they were even by pagan moralists like Juvenal.

Modern P. denotes not the performer but the piece performed, the character of which is, strictly speaking, that of a harlequinade. The Christmas P. or harlequinade has now become an essentially Brit. entertainment founded on a version of the *Commedia dell'Arte*, introduced here by one Arlecchino in the reign of James I. It became popular and was adapted by the Eng. stage, finding a concrete form in *The Tavern Bickers*, written by a dancing master of Shrewsbury named Weaver, and produced at Drury Lane in 1702. One of his P.s, entitled *The Loves of Mars and Venus*, met with great success. The arrival in London, in 1717, of a troupe of Fr. pantomimists with performing dogs gave an impetus to this kind of drama, which was further developed in 1758 by the arrival of the Grimaldi family, the head of which was a posture-master and dentist. Joseph Grimaldi, the son of the dentist, was clever at inventing tricks and devising machinery, and *Mother Goose* and others of his harlequinades had an extended run. For many years, P. consisted of a short farce or operette, known as 'The Opening,' at the end of which Harlequin transformed the characters into those of the Harlequinade—hence the transformation scene, so long a feature of P. By degrees the 'openings' became longer and longer, and the Harlequinade shorter and shorter, until it eventually vanished altogether. As this happened, the wit of the clown became a less important factor, and greater emphasis was laid on scenic effects. The chief characteristic of P. is that it must be



completely topsy-turvy. Kings and queens must be hard up and afraid of their servants and of the broker's men. The 'Principal Boy' must be played by a woman, and the prin. female role, known as the 'Dame,' by a man. These characteristics are probably based on the anct Rom. feast of Saturnalia, which took place as a pagan festival at what is now Christmas-time (when P. flourishes).

At one time almost every theatre in the country ran a Christmas P. Those produced by Sir Augustus Harris, and later by Arthur Collins, at Drury Lane became traditional, and the late Julian Wylie kept this tradition alive for years. It was understood that P.s must have local appeal, and must also be topical, full of spectacular scenes, and with plenty of music, singing, dancing, and magic. Naturally, broad comedy was a main-spring as well. For the past 60 or 70 years the usual topics have been the familiar fairy stories, but prior to that the plots were original. True Brit. P. fulfilled the difficult task of pleasing people of all ages. Much of the romance and all the magic of P. were lost with the departure of the Harlequinade, and the modern P. is a swift-moving entertainment, part revue and part music-hall or variety performance. Since the old tradition was abandoned its popularity has decreased considerably, especially in London.

See also RICH, JOHN. See C. W. Beaumont, *History of Harlequin*, 1926; and A. E. Wilson, *Christmas Pantomime*, 1934, and *The Story of Pantomime*, 1944.

Pantopoda, see PYCNOGONIDAE.

Pantotheres, or Trituberculates, fossil mammals of Jurassic age with a characteristic dentition.

Panzer, see TANKS.

Paolo di Dono, see UCCELLO.

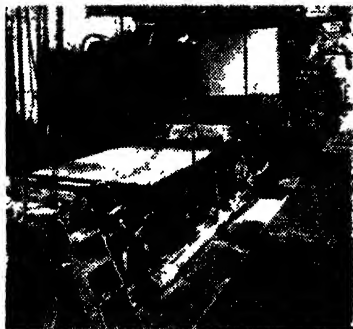
Paolo Veronese, see VERONESE.

Papacy (Medieval Lat. *Papatus*, from Lat. *papa*), position of the Pope or Bishop of Rome, with reference to his claim to be the head and centre of unity of the whole Christian Church. W. Christendom is broadly divided into 2 sections, of which one admits the claims of the P., while the other emphatically denies them. According to the Rom. Catholic belief, the P. owes its origin to Christ Himself, who gave to St Peter the primacy of the Church (see especially Matt. xvi. 18-19; Luke xxii. 31, 32), and it is claimed that at the Council of Jerusalem he occupied this position (Acts xv). St Peter ultimately came to Rome, where he lived and died as bishop of the Church in this place. His powers and office as primate of the Church were handed on to his successor, and so the office has been handed down to the present day. It is, however, important to notice that the powers are attached to the office itself. The Bishop of Rome is elected, and the peculiar papal powers are his in virtue of his being the successor of St Peter in the see of Rome. By the end of the 4th cent. the papal supremacy was generally recognised, in a theological but not in a political sense, and Leo I (440-61) may be considered as the

first of the popes to exercise his jurisdiction on a large scale. The acceptance of his famous *Letter or Tome* at the Council of Chalcedon (451) was in itself a great step. Gregory the Great (590-604) shows the political and economic side of the Rom. administration. He was responsible for sending Augustine and 40 monks to convert the A.-S. (597) and for the planning of 2 archiepiscopal sees in England, viz. Canterbury and York. He kept in close touch with the Frankish kings, whose help was continuously sought, in the centuries that followed, as a defence against the Lombards. The temporal sovereignty of the Rom. see estab. itself gradually as the Rom. emperor's authority, represented at this period by an Exarch living in Ravenna, grew weaker and weaker, and civil administration at Rome devolved more and more on the bishop. The grant of the papal states was made by Pepin in 753 to Pope Stephen II, Pepin having himself conquered them from the Lombards. A fresh epoch in the hist. of the P. is marked by the coronation of Charlemagne as emperor by Leo III (800), when the imperial name was revived. During the 9th and 10th cents. the condition of affairs at Rome deteriorated. The Pope became the mere puppet of conflicting political parties, and the papal prestige reached its lowest point. Reform, largely urged on by the great monastic orders, began in the 11th cent. under Leo IX, acting under the guidance of Hildebrand. Hildebrand himself came to the papal throne as Gregory VII (1073-85), and his vigorous campaign on behalf of the freedom of the Church was eminently successful, accompanied as it was by a moral reformation. The only Englishman to become pope, Nicholas Breakspear, reigned as Adrian IV (1154-9). For a time the papal power continued to increase and expand until it reached its culminating point in the pontificate of Innocent III (1198-1216), whose actions and success against King John of England are alone sufficient to demonstrate this. After this comes a decline. The conflict between Pope Boniface VIII (1294-1303) and Philip IV of France as to the power of the State to tax the Church ended in the victory of the Fr. monarch. About this period the popes lived relatively little in their own city, but travelled much in their states. The influence of the Fr. king was seen in the election of a Frenchman as Pope Clement V in 1305. Partly owing to this influence and the disturbed state of Italy, he took up his residence in the little state of Avignon. Here he and his successors, who were Frenchmen, were subject to the strong influence of the Fr. king, and as this period lasted over 70 years (1309-76), it has come to be known as the 'Babylonian captivity.' It did much to lower the prestige of the P. in N. Europe, and as the P. also fell heavily into debt through the extravagance of Peter Rogier, Clement VI, subsequent papal policy was marked by heavy and correspondingly unpopular taxation. In 1377 Gregory XI returned

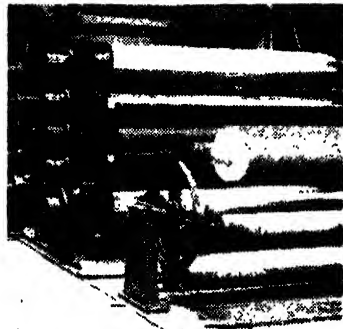
felt-covered roll running on the top side of the P., which helps to press the fibres closely together and press the water out. At this stage the sheet of P. is strong enough to be taken from the wire cloth, which returns underneath, and is conveyed by a felt through press rolls, which still further remove water and help to close up the sheet by pressing the fibres closer together. From the press part of the machine the P. now passes to a series of steam-heated cylinders, which dry it to the required degree. If the P. is required to be rough it is placed, directly after the drying process, on to a spindle and reeled up in a continuous length; if it has to be glazed it is fed through a series of highly polished rollers which impart a high gloss to the P. This describes the

usually called 'Pulp board.' To get a greater thickness of board it is necessary to build up the thickness by sticking together various numbers of sheets until the required thickness is obtained, and such boards would be described as Duplex or Triplex boards. The manuf. of much thicker boards is done on a machine where sev. layers of pulp are made in a series of vats and the resultant plies brought together and rolled up around a large-diameter roll, until the required thickness is reached, when it is cut off and fed in a flat state through special hydraulic presses and dryers, and finally rolled between two highly polished rollers. This machine is known as an intermittent board machine, and is used for the very heaviest types of boards.



Ryburndale Paper Mills

PAPER MACHINE: WET END



Bulford Paper Mills

FINISHED PAPER END

process of which is known as M.F. or Machine Finished P. P.s of this sort, however, are not always suitable for certain printing processes, and for 'art paper' it is necessary to coat the surface of the P. with China clay. This is done in modern practice actually on the P. machine itself, but in the more superfine qualities the P. is taken from the P. machine and put through an entirely separate coating and drying process. Sometimes it is necessary to impart a high degree of gloss where coating with China clay is not desirable, and this is done after the P. is made by damping it and running it through a large machine known as a super calender, which gives a finish rather better than that obtainable on the P. machine itself.

By this stage the P. is made and almost ready to be either cut into sheets or slit and reeled for use on continuous printing machines, e.g. for newspaper production. When P. is cut into sheets it is usually sorted and any substandard sheets removed, after which it is counted into reams of 480, 500, or 516 sheets. Nowadays the ream is usually standardised at 500 sheets.

The production of P. board can be done on the P. machine, provided that the thickness required is not very great, and board made on a normal P. machine is

Production of P. and board in the U.K. was 3,275,134 tons in 1956.

**PAPER QUALITIES.** There are many varieties of P.s manuf. for special duties, a few of the more common ones being listed below:

**Antique.** Usually a rough, bulky P. made to imitate the old hand-made or early machine-made P.s, as the name implies.

**Art.** P.s first manuf. and then afterwards coated with a mixture of China clay and adhesive, giving a very smooth surface; used for finer forms of printing, where a high definition of outline is required. Imitation Art P. is also made by putting a large amount of China clay on to the P. while it is being made, but is inferior to the genuine article.

**Bank.** A strongish P. of thin substance, used for letter copies, air-mail letters, etc., not to be confused with tissue (see below).

**Bible.** A very thin, opaque P. used when it is desired to get the maximum number of pages in a small-sized book.

**Bond.** A strong, thinish P. used principally for commercial stationery, usually watermarked and designed for the good appearance demanded in stationery of quality.

**Book.** A term covering the range of

papers including antique, art, bible, featherweight, M. F. printing and S. C. printing, used for the printing of books.

**Cartridge.** A strong, thickish P. originally used, as its name implies, for the packing of gunpowder in ancient muzzle-loading guns; now a hard drawing P. or a semi-smoothed surface printing P., developed mainly for printing by photo-offset lithography.

**Cigarette.** As the name implies, paper made for the purpose of the outer covering of a cigarette usually made from hemp as this material smoulders without making a smell or taste. The cheaper grades however are made from wood pulp.

**Cover.** A thick semi-board, usually in a variety of colours, used, as its name implies, for covers of pamphlets and brochures, menu cards, etc.

**Duplicating.** Absorbent P.s, manuf. for use on duplicating machines.

**Featherweight.** A very thick, light, loosely knit P., chiefly used when it is desired to make a big book with few pages, such as children's picture books, etc.

**Glazed Imitation Parchment,** known as G.I.P. A thin highly glazed P., used for wrapping sweets, toffees, etc.

**India.** A paper very similar to bible paper.

**Insulation.** P.s specially manuf. to be free from all ferrous and non-ferrous particles, and used for cable making and other purposes, where a high resistance to the passage of electric current is required.

**Kraft.** A P. used principally for wrapping, where great strength is required, e.g. cement sacks.

**Machine Glazed,** known as M.G. Made on a special machine with one large drying cylinder, this imparts a high glaze to one side of the P. only; it is used for some forms of wrapping P. and for work where it is only necessary to print on one side, e.g. posters, envelopes, etc.

**M.F. Printing.** A paper in which the finish is given on the paper machine.

**Newsprint.** As its name implies, paper used for printing newspapers and cheap books, pamphlets, etc. It is made entirely from wood pulp, mostly mechanical with a little chemical pulp added to give it strength. There are various grades of newsprints made by varying quantities of the two pulps.

**Parchment.** A name given to P. designed to imitate animal parchment; many P.s are called parchment, however, which bear no resemblance at all to the original article. The term usually describes a rough writing P.

**Printing.** A term covering a large range of papers from art paper to newsprint used for printing as opposed to wrapping, etc.

**Rice.** A misused term sometimes in reference to cigarette papers. Rice paper is an edible paper made by breaking down rice and forming it into sheets upon which certain pastries are formed and cooked.

**Super Calendered.** A printing paper in which the finish is given by putting through a large calender after it comes off the paper-making machine.

**Tissue.** A thin, soft P. used in the clothing trade, and specially made to be free from acid for use by silversmiths, jewellers, etc.

**Wet Strength.** Where P. has to be used for wrapping damp articles, such as fish, etc., or for handkerchiefs or towels, materials are incorporated in its manuf. which improve its strength when dampened.

**Writings.** A general term covering all P.s used for writing; these are usually softer and rather more bulky than Bonds and Banks, and cover a wide range from white P.s to the decorative P.s used in some forms of fancy stationery.

**BOARD QUALITIES.** There are many varieties of board, the following being among the more common:

**Pulp Boards** are made in the same way as P. and are usually single ply.

**Duplex or Triplex,** as the name implies, can be 2 or 3 ply, and are usually thicker than pulp boards. Made either by running 3 sheets together on the P. machine or by pasting together after manuf., these are sometimes referred to as Pasteboards.

**Cloth Lined** are boards where great strength and resistance to wear is required, and a form of mutton cloth is embodied in their manuf.

**Manillas** are very strong, light or heavyweight boards, used where great resistance to wear is required, such as in labels, folders, etc.

**Surface Boards** are coated in the same way as Art P., after manuf., for a similar reason.

#### PAPER SIZES. *British.*

Size	Writings and Drawings (in.)	Printing and Cartridges (in.)
Emperor . . .	72 × 48	—
Antiquarian . . .	53 × 31	—
Double Elephant . . .	40 × 26½	—
Atlas . . .	34 × 26	—
Colombier . . .	34½ × 23½	—
Imperial . . .	30 × 22	30 × 22
Elephant . . .	28 × 23	28 × 23
Cartridge . . .	—	26 × 21
Super Royal . . .	27 × 19	27½ × 20½
Royal . . .	24 × 19	26 × 20
Medium . . .	22 × 17½	23 × 18
Large Post . . .	21 × 16½	—
Copy . . .	20 × 16	—
Demy . . .	20 × 15½	22½ × 17½
Post . . .	19 × 15½	19½ × 15½
Pinched Post . . .	18½ × 14½	—
Foolscap . . .	16½ × 13½	17 × 13½
Pott . . .	15 × 12½	—
Sheet and ½ Foolscap . . .	22 × 13½	—
Sheet and ¼ Foolscap . . .	24½ × 13½	—
Sheet and ½ Post . . .	—	23½ × 19½
Crown . . .	—	20 × 15
Music Demy . . .	—	20 × 15½

The above sizes can be doubled or quadrupled, for example, Crown 20 × 15, Double Crown 30 × 20, Quad Crown 40 × 30. These sizes can also be subdivided.

complaints were not all justified; in 1834 he and his followers had drawn up an extraordinary document, known as *Ninety-two Resolutions*; some of its protests were fully justified, but generally speaking the document was bitter and unreasonable, and its approving references to the Amer. revolution were unwise. P. lost the sympathy of moderate Fr.-Canadians, and especially of the leaders of the Church, who had no wish to foment rebellion. A warrant was issued against him for high treason. He escaped to Paris, but after a general amnesty returned in 1847 to sit in the United Canadian Legislature till 1894.

Papini, Giovanni (1881-1956), It. author (pseudonym, Gian Falco), b. Florence, and largely self-taught. He helped to found the reviews *Leonardo*, 1903, and *Lacerba*, 1913. Among his vols. of essays and criticism are *Il Crepuscolo dei Filosofi*, 1906; *La Paga del Sabato*, 1915; *L'Uomo Carducci*, 1918; *Le Più Belle Pagine di A. Manzoni*, 1923; *Dante vivo*, 1933; *Italia mia*, 1939; *Figure umane*, 1940. His poetry includes *Cento Pagine di Poesia*, 1915; *Opera Prima*, 1917; *Pane Vino*, 1926. Novels: *Parole e sangue*, 1912; *Un Uomo finito*, 1912 (autobiography; Eng. trans. 1924). Formerly a sceptic, specially famous through his *Strocnature*, 1916, he accepted the Catholic faith while writing his famous *Storia di Cristo*, 1921, which has been trans. into many tongues (Eng. trans. 1923). Later works include *Dante vivo*, 1933, and *Storia della letteratura italiana*, 1937. See studies by E. Palmieri, 1927; A. Viviani, 1934; and M. Apollonio, 1944.

Papinianus, Aemilius Paulus, most celebrated of Rom. jurists, was b. towards the middle of the 2nd cent. During the reign of the Emperor Severus he held the office of Libellorum Magister, and afterwards that of Praetorius Praetoris. After the death of Severus, Caracalla dismissed P. from office and caused him to be put to death (212). P.'s works consist of 37 books of *Quaestiones*, 19 of *Responsa*, 2 of *Definitiones*, and 2 works, *De Adulteris* and a Gk fragment. P.'s immense reputation is illustrated by the Law of Citations (426), which gave his opinion the force of law in any dispute where there was no majority of jurists on either side.

Papinius Statius, see STATIUS.

Papio, or Cyncephalus, see BABOON.

Papirus Carbo, see CARBO.

Pappus, see COMPOSITAE.

Pappus Alexandrinus, eminent mathematician of Alexandria, who flourished about the end of the 6th cent. AD. He was the author of commentaries on the *Elements* of Euclid, of which fragments have been preserved by Proclus and others, and of which the section on book 10 has survived in Arabic; also on Ptolemy's *Synaxis*, of which books 5 and 6 survive (ed. A. Rome, *Biblioteca Apostolica Vaticana*, 1931), and on the *Planisphaerium* of Ptolemy and the *Analemma* of Diodorus. P.'s greatest work, however, is the *Synagoge*, an invaluable collection of mathematical writings and commentaries.

This has come down to us complete (ed. F. O. Hultsch, 1876-8). See Pappus' rule under CUBATURE.

Papua, or British New Guinea, is the SE. part of the is. of New Guinea with the d'Entrecasteaux Is., Louisiade Archipelago, and the small is. between 8° and 12° S. lat. and 141° and 155° E. long. Area 90,540 sq. m. Pop. 375,000. P. lies wholly within the tropics, and has a very irregular and indented coast-line. The SE. rises to a series of mt. ranges, the highest point of which, Mt. Victoria, attains 13,120 ft. The chief rvs. are the Fly, Turama, and Bamo. The rainfall is heavy and evenly distributed, except in one belt of land which has a dry season and produces tobacco and cotton. The wetter parts produce a variety of crops, sugar-cane, coconuts, sago palm, bread fruit, dyewoods, spices, ginger, and bananas and other fruits. Many minerals occur, gold, copper, tin, lead, zinc, and cinnabar, also brown coal and petroleum; gold, silver, and osmium are the only minerals exported. Topaz and beryl are the only precious stones. There are wireless telegraph stations at Port Moresby and Samarai. The races vary in colour, mode of living, and language, and most of the coastal people are not of Papuan origin but are descended from races of more distant parts of the Pacific. Capital Port Moresby (q.v.). In 1901 occurred the massacre of the Rev. James Chalmers and his party by the Goaribari tribe, followed by the Le Hunte punitive expedition, which burned down dozens of *dubes* or native vils. But tribes have in large areas settled down to peaceful habits, while hundreds of the natives are being taught by the many missionary bodies in P.

In order to prevent that portion of New Guinea not claimed by the Dutch from passing into Ger. hands, the Queensland Gov. annexed it in 1883, a step not sanctioned by the Imperial Gov. In 1884, however, a Brit. protectorate was proclaimed over the S. portion of the E. half of New Guinea, and in 1887 Queensland, New S. Wales, and Victoria agreed to share the cost of administration. The ter. was annexed to the Crown the following year. The Federal Gov. of Australia assumed the control in 1901; the political transfer was completed by the Papua Act of 1905, passed by the Federal Gov., and in 1906 a proclamation declared that New Guinea would be known as the ter. of P. Occupied by Japanese during Second World War. See also MELANESIA. See A. F. R. Wollaston, *Pygmies and Papuans*, 1912; Sir H. Murray, *Papua of To-day*, 1925; I. F. Champion, *Across New Guinea from the Fly to the Sepik*, 1932; E. Cheesman, *The Two Roads of Papua*, 1935; J. G. Hides, *Through Wildest Papua*, 1935; and L. Lett, *The Papuan Achievement*, 1942.

Papule (Lat. *papula*, pimple), small, round, solid elevation of the skin. See RASH.

Papworth Village Settlement, vil. settlement, founded by Sir Pendrill Varrier Jones (a tuberculosis officer in Cambs)

for the rehabilitation of tubercular cases, the largest of its kind in the world. Begun in 1917 on a nucleus of a few shelters and an old house, it is now a community of some 2000 people who have been helped to health and enabled to support themselves by their own efforts. In addition to 3 hospitals, 5 hostels, and nurses' homes, there are now some 200 houses and 5 large modern factories employing 700 men and women making, for home and export, prefabricated buildings, coach-building and joinery products, cabinet furniture, and travel and upholstery goods; printing and bookbinding are also carried on. Although the hospital section has now been absorbed into the national health scheme, the hostels, factories, and vil. retain their individual identity.

Papyrology, in the widest sense, is that branch of learning which seeks to decipher and determine the date and place of anything written on papyrus. The oldest books known are written on rolls of papyrus, and the earliest preserved written papyri go back to the 5th Egyptian dynasty (about 2750-2625 BC); they are couched in Egyptian language and hieratic writing (see under HIEROGLYPHIC AND HIERATIC WRITINGS). Other papyri are written in Egyptian demotic or Coptic scripts, in Aramaic, in Greek, Latin, Persian, or Arabic.

Use of papyrus lasted through Gk and Rom. times to the early Middle Ages. The middle of the 10th cent. seems to be the period when its manu. (in Egypt) ceased, but already since the 4th cent. AD in S. Europe, under Christian, Rom., and Byzantine influence, papyrus was gradually displaced for writing books by parchment and vellum.

In the strictest sense of the term, P. indicates Gk P., and particularly deals with the period in which Egypt was more or less completely under Hellenic influence and Greek was one of its main languages. The upper limit of this period may be fixed at 332 BC, corresponding with the conquest of Egypt by Alexander the Great, and the lower limit about 2 centuries after the Arabic conquest of AD 641, when Arabic had definitely triumphed. The reason of this restricted use of the term P. lies in the following facts: (1) The manu. of papyrus was confined to Egypt, and it is most probable that the estab. of the great Alexandrian library led to improvements in its manu., and stimulated production. (2) Although, in the countries bordering on the Mediterranean, papyrus was until the 4th cent. AD the most common writing material, on account of climatic circumstances and because of the damp soil no papyrus could long survive except beneath the splendid protective covering of the sands of Upper Egypt (some charred papyri have been found in Lower Egypt and in Herculaneum, Italy; a few fragments have been discovered in Palestine and in Dura Europos in N. Mesopotamia). (3) The number of the preserved Gk papyri is estimated at about 30,000. Thanks to them we have at our

disposal so many data of so great a variety that there is no region in antiquity of which we know the legal, social, religious, cultural, economic, and domestic life so well as Graeco-Rom. Egypt.

P. is a new branch of knowledge; although the first papyrus brought in modern times from Egypt to Europe (the 'Papyrus Schow' or *charta Borgiana*, now in Naples) reached Europe in 1778, and in the 19th cent. considerable finds were made in various places in the Fayûm, only in the last decade of that century were systematic excavations and research for papyri organised (W. M. Flinders Petrie on behalf of the Egyptian Exploration Fund, 1890; B. P. Grenfell and A. S. Hunt, of Oxford, 1896). P. is of paramount importance for the study of the Gk civilisation of Egypt in the following fields: writing, language, public and administrative law, social, economic, and religious life.

See W. M. Flinders Petrie, *Ten Years Digging in Egypt*, 1892; L. Mittels and U. Wilcken, *Grundzüge und Chrestomathie der Papyruskunde*, 1912; W. Schubart, *Einführung in die Papyruskunde*, 1918; P. Collomp, *La Papyrologie*, 1927; F. G. Kenyon, *Fifty Years of Papyrology*, *Actes du V<sup>e</sup> Congr. intern. de papyrol.*, 1938; A. Calderini, *Manuale di papirologia antica greca e moderna*, 1938; W. Peremans and J. Vergote, *Papyrologisch Handboek*, 1942; and M. David and B. A. van Groningen, *Papyrological Primer*, 1946.

Papyrus, whence Eng. 'paper,' Gk *papyros* (also *bublos*, *biblos*, hence Bible). The term P. is of Egyptian origin, meaning 'the growth of the River (Nile).' It is a straight, stout, tall, reed-like, aquatic plant, called in Latin P. *antiquorum* or *Cyperus papyrus* (q.v.), which in ancient times grew in profusion in Egypt on the R. Nile. It also grew, but in small quantities, in N. Palestine. Nowadays it grows only in Abyssinia and in Sicily, but it is reared as a curiosity in many botanical gardens (also in England, where, however, it needs to be removed under cover in the autumn). Its leafless stems rise from 4 to 15 ft above the water, and have umbrella-like tops of delicate green rays. The ancient Egyptians used the stems of this plant to make ropes, mats, sandals, framework of light rowing boats, and for other purposes, but the prin. importance, at least in modern eyes, was the use of P. as writing material. A detailed account of the way in which the P. was treated in the Egyptian 'paper factories' is given by Pliny the Elder (*Naturalis historia*, xiii. 74 ff.), the great Rom. naturalist (AD 23-79). A section from the lower part of the stem, the pith, was cut vertically into thin strips; these were laid some vertically and others transversely, pressed together, and dried in the sun. Uneven patches were smoothed or pressed away, and the surface was polished more or less carefully according to the quality to be produced. The sheets were then glued together into a roll. The length of the rolls varied; some were 30 or 40 ft long, but we are told of some

that were 150 ft long, and would contain the whole *Iliad* or *Odyssey*.

The oldest books known are written on rolls of P., and the earliest preserved written papyri go back to the first half of the 3rd millennium BC. P. was not only employed for literary purposes. In Egypt, Greece, Rome, Syria, etc., it was for many centuries the chief material used for writing for all ordinary purposes, such as legal documents, receipts, petitions, notices of birth, and official and private letters. Its employment for these purposes continued until the middle 11th cent., while as writing material for books it was gradually displaced by parchment or vellum, which had superseded it in the 4th cent. AD. See PAPER; Papyrology; PARCHMENT; VELLUM; MANUSCRIPTS.

Par, or Parr, see SALMON.

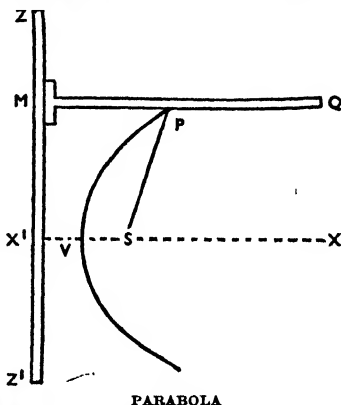
Pará, original name for the R. Amazon. The name is now applied to the estuary in the P. state of Brazil, popularly described as a mouth of the Amazon. It really belongs to the Tocantins and Amapá R.s., and is only connected with the Amazon by a tidal 'furo' (bore).

Pará, or Grão Pará, maritime and third largest state of Brazil, bounded on the N. by the Guianas and on the NE. by the Atlantic. Area 469,778 sq. m., including the large delta is. of Marajó (q.v.). It lies almost entirely in the Amazon basin, and is copiously watered by the Amazon, P., Tocantins, Xingú, Tapajós, and smaller rivs. The higher ground is almost desert. The great part is still dense forest, but settlements have been made along the rivs., and cacao, sugar, cotton, caoutchouc, Brazil nuts, plumbago, rice, manioc, millet, vanilla, etc., are produced; also some gold and diamonds are found. P. produces some of the world's finest rubber, but despite the Fordlândia experiment, production has greatly declined. For its cap., see BELÉM; other cities are Obidos, Santarém, Gurupá, Concoção, Bragança (qq.v.). Pop. 1,142,846.

Parable, originally the name given by the Gk rhetoricians to an illustration avowedly introduced as such. In Hellenistic and N.T. Greek it came to signify an independent fictitious narrative, employed for the illustration of a moral rule or principle. This kind of illustration is found in the O.T. and N.T., particularly in the discourses of our Lord. Much of Christ's parabolic imagery is also to be found in the writings of Hillel, Shammai, and other great rabbis, as, for example, the Pearl of Great Price, the Labourers, the Lost Piece of Money, the Wise and Foolish Virgins, etc. The P. differs from the fable in the probability or verisimilitude of the story itself, and agrees with it in the essential requisites of simplicity and brevity. It differs from the allegory (though some of Christ's P.s. come very close to allegory) in that it illustrates as a rule one point only, whereas in an allegory almost every detail of the story has another meaning.

Parabola, locus of a point P whose distance from a fixed point S, the focus,

is equal to its distance from a fixed line  $ZZ'$ , the *directrix* (see figure, where  $SP = PM$ ). The figure also shows a simple method of construction;  $SPQ$  is a string attached at S and Q and equal to  $MQ$ ; the T-square  $MQ$  is moved along the ruler  $ZZ'$ , while a pencil keeping the string tight and against the T-square traces the curve. A line  $XX'$  through S perpendicular to the directrix  $ZZ'$  is called the *axis*; it meets  $ZZ'$  at the foot of the directrix. The curve is symmetrical to the axis, which cuts it at the *vertex* V, and extends to infinity, always receding from the axis. The *latus rectum* or focal width is the chord of curve through the



focus S and perpendicular to the axis. The angle  $SPM$  is bisected by the tangent at P, hence the parallel beams from the light in the focus of a parabolic reflector. The curve is a conic section made by a plane cutting a cone in a direction parallel to the generating line and is a special case of the conics governed by the relation  $SP = ePM$ ,  $e$  being called the *eccentricity* of the curve. For the P.,  $e = 1$  (see GEOMETRY, Higher Pure G). The path of a projectile when not truly vertical is practically a P. except for interference of air and other irregularities, the recognition of which fact has been of enormous utility in military matters. In co-ordinate (Cartesian) geometry the equation for a P. in the simplest form, taking the origin at the vertex, is  $y^2 = 4px$ , where  $2p = sz^2$ . All curves of the form  $y^n = px^m$  are classed as P.s.;  $y^2 = px$  is the cubical P.,  $y^3 = px^2$  is the semi-cubical P.—the evolute of the P. of the second degree.

Paraboloid, figure traced by a parabola moving with its vertex always on another parabola, the planes of the two being constantly at right angles to each other. The elliptic paraboloid is traced when the concavities are kept in the same direction; its plane sections are either parabolas or ellipses. The hyperbolic paraboloid is traced when the concavities are kept in

opposite directions; its plane sections are parabolas or hyperbolas. See GEOMETRY, *Higher Pure G.*

**Paracatú**, tn of Brazil, in the state of Minas Gerais, 300 m. W. of Ouro Preto, a former gold mining centre. Pop. 5000.

**Paracelsus**, or **Theophrastus Bombastus von Hohenheim** (1493-1541), Swiss physician, b. near Einsiedeln, the son of a physician. After a period at Basle Univ. he studied chemistry under Trithemius, abbot of Sponheim. He then spent some while in the Tyrol studying the mechanics of mining, mineralogy, and the diseases of miners. Returning to Basle in 1526, he was appointed to physician and a lecturer at the univ. But many of P.'s views were opposed to the best contemporary teaching, and he himself was of an arrogant and quarrelsome nature; he was driven from Basle, 1529, and for the next 12 years practised as a wandering physician in various Ger. and Swiss tns. In 1541 he settled at Salzburg, where he d. soon afterwards. The first ed. of his complete works was that by J. Huser (1589-91); the best modern eds. are those by K. Sudhoff and W. Mathiesen (14 vols., 1922-33), and J. Stoeckel (abridged, 3 vols., 1916). See A. M. Stoddart, *The Life of Paracelsus*, 1911; W. P. Swainson, *Theophrastus Paracelsus*, 1939; J. Hargrave, *The Life and Soul of Paracelsus*, 1951.

**Paracentric Motion**, term used by Leibnitz to express the motion which, together with harmonic circulation, made up the entire motion of a planet.

**Parachor**, in chem., a function used by Sugden and others in the investigation of the constitution of various compounds. The P. of a liquid is given by the expression

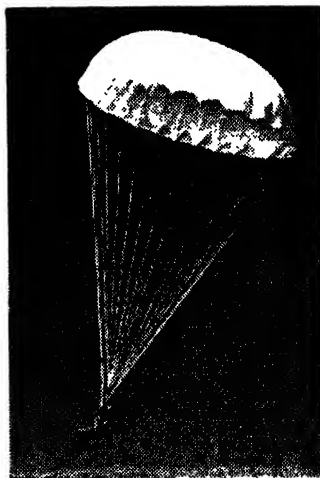
$P = \frac{M\gamma^{\frac{1}{3}}}{D}$ , where  $M$  = molecular weight,  $D$  = density, and  $\gamma$  = surface tension of the liquid.

**Parachute**. The P. probably derives from both the umbrella and the ship's sail, and there are even Chinese legends of large hats being used when men jumped from high places. Leonardo da Vinci (c. 1500) may fairly be said to have invented the modern P., but his tent-shaped design was not known until late in the 19th cent., and so had nothing to do with the practical invention. Veranzio (c. 1595) also suggested a sail-like P., but this did not lead to any practical developments. Small P.s were in use during the early years of ballooning (1783 onwards) for sending down dogs and cats from the air. The first human P. drop (from a balloon) was by the Frenchman A. J. Garnerin at Paris in 1797. After that date parachuting was a common showman's 'turn' throughout the 19th cent., the parachutist sometimes being taken up by a hot-air balloon. Both men and women made these drops.

The first jump from an aeroplane was by Berry at St Louis (U.S.A.), after which exhibition jumps were common. The first lives to be saved by jumps from aeroplanes were those of 2 Ger. aviators in

1918. The First World War also saw P.s used extensively for escaping from observation balloons, but aeroplane P.s were not used by the Allies, and only at the end of the war by the Germans. The automatic P. (see below) owes much to Leslie Irvin, who developed his P. in the U.S.A. after the First World War.

P.s to-day are used not only for dropping from aircraft, but for sending down supplies, and for acting as auxiliary brakes for high-speed aircraft when landing. Supplies may be dropped using either one P., often a giant one, or clusters supporting one heavy item, such as a gun or truck.



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PARACHUTE

The conventional aircrew P. of to-day is fully automatic; it is either released manually by a pull from the airman, or, in the case of high-altitude aircraft, where delayed action is required, operated by a barometric aneroid device at a given height. Once put into operation, a small P. is ejected first from the pack, which then draws out the main P., the latter being kept steady by a hole in the crown through which a column of air is forced as the P. descends. Some P.s to-day are constructed of concentric 'ribbons' with space between each, instead of a 'solid' canopy with the crown aperture; others with the canopy 'broken open' at intervals. There are also certain P.s operated on the helicopter principle, which consist of freely turning rotor blades; but these are not used for human drops.

Apart from their human and supply-dropping functions, P.s are now in common use to bring down valuable instruments sent up beneath meteorological

balloons, which are allowed to burst at their maximum altitude, and for similar descents on occasion from research rockets.

**Parachute and Airborne Troops.** The first expression is sometimes loosely used to cover the meaning of the second. A. T. are of all arms and are specially trained and equipped to arrive at the scene of action by air, usually in ter. held by the enemy. They may be transported in gliders or powered aircraft which land and disembark small units complete in the assembly area, or, as P. T. proper, they may drop by parachute from aircraft, together with the greater part of their weapons and equipment. All the infantry and a proportion of other arms of a modern airborne div. are trained as P. T. Training of P. T. is strenuous, both physically and mentally, and consists in exercises of endurance and agility similar to those performed by commandos, together with jumping from towers, moving vehicles, captive balloons, and finally aircraft.

The employment of parachutists as an integral part of military organisation was first demonstrated by Russia in 1936. Although in the Second World War Russian A. T. confined themselves to the role of organising and leading partisans in the Ger. back areas, in the W. this war saw a rapid development in the use of A. T. Parachutists were extensively employed by both sides for purposes of espionage and sabotage, but A. T. were first employed on a large scale by the Germans in the Low Countries in the spring of 1940, notably in the capture of Dutch airfields by parachutists, and of the fortress of Eben Emael on the Albert Canal by glider-borne troops. The invasion of Crete in 1941 may be taken as the culminating point of the Ger. airborne effort. After this, though the number of Ger. parachute divs. rose considerably, they were never used in their proper role, owing to the lack of transport aircraft to land and supply them. Ger. airborne divs. formed part of the Luftwaffe.

Brit. P. T. began their operations with harassing and reconnaissance operations such as the raids on Lofoten and Brunel and in support of the Canadian sortie against Dieppe. Parachutists were used in the allied landings in N. Africa in 1942, and A. T. in gliders flown by sergeant-pilots of the Glider Pilot Regiment took part in the invasion of Sicily, especially in the fighting round the Gornalunga Bridge, where they came face to face with Ger. parachutists. The Brit. 2nd Parachute Brigade occupied strong points in Catania to prepare the Eighth Army's landing there, and the same brigade was used in a sea-landing role at Taranto, and operated around Gioia del Colle between there and Bari. It also took part in the Sangro battle late in 1943, but not in an airborne role.

On the W. front the allied landings in Normandy were preceded by heavy droppings of parachutists, especially on the left bank of the bridgehead. In the autumn of 1944 an attempt was made to

seize the crossings of the Lower Rhine by dropping elements of the Brit. 1st and 6th Airborne Divs. and a Polish parachute brigade at Arnhem and Amer. P. T. at Nijmegen. Owing to unfavourable weather, the quickness and violence of the Ger. reaction, and the failure of the Brit. Second Army to break through the Ger. troops encircling the Arnhem bridgehead, the Brit. and Polish P. T. had to be withdrawn. In support of the crossing of the Rhine by the allied 21st Army Group large forces of the 1st Allied Airborne Army were dropped a short distance



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#### BRITISH PARATROOPS

behind the Ger. defences on the right bank of the riv. This operation may be taken to demonstrate the diminishing margin of profit accruing from the use of A. T. They were first employed to achieve surprise and attack in depth. As their use became more frequent so the element of absolute surprise diminished. As the reaction of the defence became more rapid and determined, so the time permissible in which they might effect a junction with their own ground forces was reduced and their range of action, the depth to which they could attack, was shortened. The Arnhem operation showed how short was the time during which a large airborne force could be supported and supplied from the air except under the most favourable weather conditions. At this stage of the war it may be noted that 2 Ger. parachute divs. were fighting as ground troops in Italy, and the remaining 7 in a similar role on the Lower Rhine. Yet such was the allied air superiority that none of these Luftwaffe troops could be dropped from the air, and the Ardennes offensive of Dec. 1945 was deliberately mounted in weather conditions which it was hoped would preclude air activity. Typical Ger. airborne operations of the second half of the war are the rescue of Mussolini from his prison on the Gran Sasso d'Italia by A. T. under the Waaffen



S.S. Maj. Skornzeny in 1943 and the attempt to kidnap Tito at his headquarters in 1944. Both are good examples of the kind of *coup-de-main* to which the airborne arm lends itself.

In the last stages of the It. campaign allied P. T., including elements of the It. Nembo and Folgore divs., were dropped to secure crossings of the Po and the Adige. P. T. were used by the Brit. and Fr. armies when they intervened in Egypt in 1956.

P. T. in general are armed with ordinary hand weapons as carried by infantry, but some have been modified so as to reduce weight and bulk, as have some infantry support weapons such as the Brit. 3-in. mt howitzer and 6-pounder anti-tank gun. Airborne engineer equipment consists mainly of explosives for demolition, prepared charges of all kinds, and light-weight anti-tank and anti-personnel mines. Special parachutist weapons and equipment have included the Ger. *Fallschirmgewehr* (an automatic rifle) and recoilless infantry gun, and the Brit. 'Corgi'-type collapsible motor-cycle. Special types of tank have also been modified for airborne use. The parachute and airborne units now forming part of the Brit. Army are the Glider Pilot Regiment and the Parachute Regiment, which together form the Glider and Parachute Corps and the Special Air Service Regiment. See F. O. Mksche, *Paratroops*, 1943, and H. St George Saunders, *The Red Beret*, 1949.

**Paraclete** (Greek for advocate), name given to the Holy Ghost by Christ, who promised his disciples the P. would take His place as their teacher and guide after He left them. The name was given to the monastery founded by Abélard near Nogent-sur-Seine, of which Héloïse was abbess. See also HOLY SPIRIT.

**'Parada,'** see ARMY NEWS SERVICES.

**Para-dihydrobenzene,** see HYDRO-QUINONE.

**Paradise** (from Gk *paradeisos*, a park or enclosure), word first used in Greek by Xenophon for a Persian enclosed park or pleasure ground. It occurs sev. times in the O.T., notably in Neh. ii. 8, where it is trans. 'forest.' In Christian literature it is used sometimes for the earthly P., the garden of Eden, and sometimes as equivalent to heaven. Sometimes the word means an intermediate state lower than that of heaven, as in Luke xxii. 43 and in Dante's *Purgatorio*.

**Paradise, Bird of,** see BIRD OF PARADISE.

**Paradise Fish,** or *Macropodus opercularis*, a species of spiny-finned fishes of the family Anabantidae found in Asia. As in the related fighting-fishes (*Betta*), the males when in breeding colours are very pugnacious.

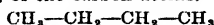
**Paradise Wood,** see ALOES WOOD.

**Paradox** (Gk *para*, against, *doxa*, opinion) may be described as an epigram (q.v.) containing an apparent contradiction which on closer examination reveals a substratum of truth, as in Shakespeare's line, 'Cowards die many times before their deaths,' or Wordsworth's 'The child

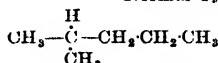
is father of the man.' See also FIGURE OF SPEECH.

**Paradoxure** (Gk *paradoxos*, i.e. adj.: 'contrary to received opinion,' + *oura*, 'tail'), animal of the genus *Paradoxurus*, family Viverridae, or of an allied genus; so called because of its remarkably long curving tail. Also called palm-cut, -marten, or -civet.

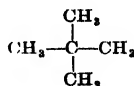
**Paraffin**, important branch of organic compounds called the methane series. The name (from Lat. *parum affinis*, small affinity) was given to it because P. wax (see below), which consists almost entirely of paraffin hydrocarbons, is not susceptible to the action of strong acids, alkalis, etc. The more important members of this series are the following: Methane ( $\text{CH}_4$ ) boils at  $-11^\circ \text{C}$ . under 180 atmospheres. This gas is frequently present in decomposing matter and is alternatively known as marsh gas. Ethane ( $\text{C}_2\text{H}_6$ ) boils at  $+4^\circ \text{C}$ . under 46 atmospheres; propane ( $\text{C}_3\text{H}_8$ ) boils at  $-42^\circ \text{C}$ . under 1 atmosphere; butane ( $\text{C}_4\text{H}_{10}$ ), boiling point  $0^\circ \text{C}$ . under 1 atmosphere; isobutane ( $\text{C}_4\text{H}_{10}$ ), boiling point  $17^\circ \text{C}$ . under 1 atmosphere. It will be noticed that there is a constant difference of  $\text{CH}_2$  in their composition, while they have similar chemical properties. Such a series is called a *homologous series*, this series having the general formula  $\text{C}_n\text{H}_{2n+2}$ , where  $n$  stands for any positive integer. The fourth member, butane, presents a peculiarity in that there are 2 distinct bodies possessing the same composition, while they differ in properties. They are distinguished by the 2 names given, and are represented constitutionally by  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$  and  $(\text{CH}_3)_2\text{CHCH}_3$ . Such compounds are said to be *isomeric* (equal measure), the second being called an *isomer* of the other. The number of isomers rapidly increases with the number of carbon atoms in the compound. There are 3 main types of P.s. known respectively as Normal, Iso, and Neo, according to the manner of grouping of the carbon atoms.



Normal Type  $\text{>CH}_2$



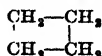
Iso: Type  $\text{>CH}$



Neo: Type  $\text{>>C}$

The boiling points of the isomers are always lower than those of the unbranched series. The P.s. are found in nature as a main constituent of petroleum in the U.S.A., U.S.S.R., Middle E., Borneo, Venezuela, Burma, etc. Some of the lower P.s. occur as natural gas, e.g. in U.S.A., and some are found in the intestinal gases of animals and in the gases

given off during the putrefaction of vegetable and animal matter. The *cyclo*-P.s are ring compounds, e.g. *cyclo*-butane is



P. wax is a substance derived as a distillate from crude petroleum. The wax corresponds in boiling range to the lubricating oil fraction, from which it must be removed after primary distillation, since it seriously interferes with the lubricating properties of the oil. The removal is effected by chilling the distillate and filtering off the wax crystals which form at low temps. The wax obtained is chiefly used for the manu. of candles, but it is also used in the waxing of paper and for certain water-proofing purposes, as well as in polishes of various kinds. See also WAX.

Liquid P. is the name given to a highly refined fraction of petroleum in the lubricating oil range, which is used for medical purposes as an internal lubricant and aperient. The same product is also used as an emulsifier or solvent in medical sprays, etc. Large quantities of fuming sulphuric acid or oleum, that is, sulphuric acid containing excess of sulphur trioxide, are used in refining liquid P., as it is essential that any tendency to form sludge is removed and that no reactive constituents should remain in the final product. The use of these large quantities of sulphuric acid gives rise to the formation of sulphonic acids, and these are removed by neutralisation with a strong alkaline solution containing alcohol. After neutralisation the oil is treated with decolorising earth and filtered to produce the water-white, odourless, tasteless liquid P.

In the U.K. the term P. or P. oil is popularly but inaccurately applied to kerosene (q.v.), especially when used domestically as a fuel for heating and lighting. This is the product also used as a fuel for tractors (vaporising oil) and jet aircraft (aviation kerosene).

Paraguay, see PALAWAN.

Paraguari, tn of Paraguay, S. America, cap. of the dept of P., 45 m. by rail from Asunción. It produces tobacco, cotton, and cattle, and there are potteries, tanneries, and distilleries. Pop. 12,700.

Paraguay, republic of S. America, with no sea-board, bounded N. by Bolivia, NE. and E. by Brazil, and S. and W. by Argentina. Topographically P. forms part of the great depression known as the basin of Paraná, whose W. edge is formed by the Andes, and on the E. is bounded by the Brazilian highlands. To the N. rises the sheer edge of the Mato Grosso table-lands of Brazil, and to the SW. is the Gran Chaco, part of whose vast and partly unexplored ter. forms the W. portion of P. P. has been the 'subject of exaggerated descriptions: on the one hand, it has been condemned as a pest-ridden and poverty-stricken land of unbearable tropical climate, and on the other, lauded as full of great possibilities and pleasing

features. In reality it is a country of contrasts, affording compensating circumstances and varied conditions both of nature and people . . . much of the country merits the description of a natural garden, where flowers and fruit run riot, even around the thatched, mud-walled huts of the squatters, in certain districts' (C. R. Knock). The area of P. proper (i.e. excluding the Chaco or 'occidental section') or 'oriental section' is officially given as 61,600 sq. m. The Chaco formed the subject of a long-standing dispute with Bolivia and led to war in Sept. 1932, which ended with an armistice only on 12 June 1935, followed by a peace treaty signed in July 1938, the boundary being fixed by arbitration (Oct. 1938). The consequent increased area of P.'s occidental section is officially estimated at 95,447 sq. m., making the total area of the republic approximately 157,047 sq. m. Pop. (1950 census) 1,400,000, of whom Indians number 8000. The people of P. are of mixed blood, namely Spanish, Indian, or Guarani, and mestizo (mixed European and Indian), the most predominant being the Guarani. There are practically no Negroes in P., and the admixture of foreign blood is less than in any of the other S. Amer. republics. The white element, as always, forms the governing class, and the official language is Spanish, although the common speech is Guarani. The Paraguayans are a far less ambitious people than their neighbours of the Argentine, but modern civilisation slowly progresses.

P. is bisected by the riv. of its own name. The Paraná flows along its E. border, while the Pilcomayo forms its W. boundary till it joins the P. near Asunción. In the angle formed by the Paraná-P. confluence are extensive marshes, one of which, called Neembucú, i.e. 'endless,' is drained by Lake Ypoá, a large lagoon SE. of Asunción. E. of the Paraná R. the country has always been known as E. proper, while on the W. and SW. lies the region of El Gran Chaco. The portion lying within the P. ter. (prior to the treaty of 1938) consists largely of swamp, forest, and jungle, inhabited by semi-civilised Indian tribes, among whom the S. Amer. Missionary Society has long been doing good work. This region is also the haunt of the jaguar and numerous reptiles. There are large areas of good grazing ground, which support many cattle. The N. portion of P. is mountainous, but the S. portion is one of the most fertile districts in S. America, consisting of hills and gentle slopes, richly wooded, wild savannahs, and rich alluvial plains, some of which, however, are marshy. Much valuable timber is found in the forests, including hard, soft, and dye woods. The rainfall of P. is sufficient for agric. production, and the climate, though sub-tropical, is agreeable and healthy.

*Production.* The whole area of the oriental section of P. is cultivable, the soil affording facilities for meadows and pastures which are capable of a varying agriculture, such as might render the country the orchard and garden of that

part of the S. Amer. continent. Only a small part, however, has as yet been brought under cultivation. Stock-raising is one of the prin. industries, the country being well adapted to it. About one-third of the whole area is devoted mainly to the raising of horses, cattle, swine, and sheep. The cattle number about 4,500,000, and those not used for home consumption are exported in the form of meat extract, preserved meat, and jerked meat, over 100,000 head of cattle being slaughtered annually for this trade. Herds are to be found in most parts of the country, but it is in Misiones, the area N. of Concepción, and in the Chaco that the greater part exist. Agric. methods are primitive. The inadequacy of labour and the backwardness of communications render scientific agriculture difficult. Tractors, modern ploughs, and agric. implements in general are being introduced upon a large scale. Two botanical schools have been opened by the gov. The country is especially noted for yerba maté (strong flavoured Paraguayan 'tea'), a plantation product as well as a natural product of the forests. The leaves of the shrub (*Ilex paraguayensis*) are stripped, dried in the sun, packed in sacks, and exported. The cost of production is small and the article is sold at less than the price of tea and coffee. During the war with P. the Brazilian soldiers marched and fought day after day without any other sustenance. It is consumed all over S. America, and the output is from 12,000 to 20,000 metric tons, exports ranging from 4000 to 8000 metric tons. Yerba maté wild trees cover nearly 1,500,000 ac.; the acreage under cultivated trees is less than 30,000. Among other industries are timber cutting, fruit growing (tangerines, grapefruit, etc.), petit-grain essence (an essential oil distilled from the leaves of bitter oranges and used for perfumes and flavourings), and tobacco, while maize (135,000 ac.), manioc, beans, and various cereals are cultivated. Many rare woods are still largely unknown in foreign markets. Among the more abundant woods are cedar, curupay, and lepecho. Cedars and hardwoods are a valuable article of export, much timber being exported to the Argentine and Uruguay for girders and railway sleepers. In the Chaco the production of quebracho logs is a growing industry (about 40,000 metric tons per annum). The chief product is quebracho extract (tannin), of which as much as 40,000 metric tons are exported annually. Some 25,000 ac. are under sugar cultivation, mainly for the manuf. of spirit. There are 10 sugar-mills, the most important of which are the Tebicuarí and Azucarera Paraguaya. Other products are bananas, rice, and peanuts, while another crop which is gaining ground is cotton, now about 170,000 ac. Cotton is commonly sold as Argentine cotton, chiefly to the U.K. Cotton-seed oil is also a thriving industry. Iron, manganese, copper, and other minerals occur plentifully. Sev. iron-ore mines exist (e.g. Ibicuí) which were exploited in the time of López, whose foundries made cannon, cart-axes, and

tyres. The Quilicó manganese mines contain ore deposits estimated at 60,000,000 tons. Copper has been found at San Miguel, Concepción, and Quilicó. Other minerals include granite, marble, serpentine, and kaolin. Large deposits of lithographic stone of good quality were discovered a few years ago. The few secondary industries of P. produce only for the home market, the exceptions being the meat-canning factories, quebracho-extracting plants, and saw-mills. Cheap-quality textiles are made from home-grown cotton, which is both ginned and spun in P. In 1954, total exports were *guaraníes* 813,000,000 and imports *guaraníes* 992,400,000. The chief exports are cotton, quebracho extract, timber, hides, meats, petit-grain, and tobacco. The chief imports are articles of food and drink, agric. machinery, cotton goods, and vehicles. In 1947 imports from the U.K. were valued at £308,534 and exports to the U.K. were £1,784,235; in 1957 they stood at £1,153,106 and £2,414,746 respectively.

**Government.** The present constitution was promulgated on 10 July 1940. Under it wider powers are vested in the president than were given by the constitution of 1870. Though basically democratic, there are authoritarian and corporative features in the new constitution. The executive power is exercised by the president, who is elected for 5 years and appoints the Cabinet. The Senate was abolished in 1940 and replaced by a council of state as the legislature. This council is nominated by the Cabinet and is composed of the archbishop, the rector of the univ., together with representatives of commerce, industry, agriculture (2), the army and navy (1 each), and the president of the National Bank (opened in 1943). There has been a Chamber of Representatives since April 1948, there being 1 member for every 25,000 inhab. Elections are held quinquennially. The constitution guarantees private property, but the State has power to regulate economic activities, and 1 of the Cabinet posts is occupied by a minister of national economy.

**Religion, Justice, and Education.** The estab. religion is Rom. Catholicism, but universal toleration is the rule. P. has its own archbishop, whose see is at Asunción. There are bishops at Concepción and Villarrica. The civil ceremony alone renders marriage valid, but religious ceremonies are permitted. There are a supreme court, 2 courts of appeal (civil and commercial, and criminal), 10 judges of first instance, and 3 metropolitan police magistrates. The fiscal-general represents the State both in civil and criminal cases. In the provs. the functions of magistrates are exercised by lay justices of the peace, who also act as registrars; but Villarrica, Encarnación, Concepción, and Pilar have judges of first instance, civil, commercial, and criminal. Primary education is free and compulsory and is also provided for adults. There are about 1600 gov. primary schools and 74 private, with a total attendance of about 240,000

pupils, and over 7500 teachers. There are 83 secondary schools and special schools and a national univ. with about 2300 students, and there are also a number of special colleges and 100 vocational schools, half of which latter are in the cap.

**Defence.** There is an army of 3 divs., each with 2 regiments; a group of artillery, a group of cavalry, and a battalion of motorised engineers; also 2 regiments of mechanised 'cavalry' and 1 mounted regiment. There are 3 squadrons of aircraft. In war service is compulsory for those aged between 18 and 20 in the active army; between 20 and 29 in the active army reserve; between 29 and 39 in the national guard; and between 39 and 45 in the territorial guard. The navy comprises 2 armoured gun-boats, 2 converted merchantmen, and some well-armed river craft.

**Communications.** The P. R. is navigable for 12-ft draught vessels up to Concepción (180 m. N. of Asunción) and for smaller vessels for another 600 m. northward. The Paraná R. is navigable by large boats from Corrientes as far as Puerto Aguirre. Asunción, the chief port, is 950 m. from the sea. There are only 300 m. of public railways, together with 450 m. of private industrial rail lines, and less than 4000 m. of roads, mostly indifferently. The Paraguayan Central Railway, with 274 m. of standard gauge line, is a Brit.-owned railway, running from Asunción to Encarnación. It is one of the oldest S. Amer. railways and had its beginning in 1854. There is now a through train service from Asunción to Buenos Aires. The Ferrocarril del Norte Railway has 33 m. of metre-gauge line from Concepción to Horqueta. The other minor railways are forest lines of metre gauge or narrower. Air services are provided by 6 air lines (domestic and foreign). Contact with the neighbouring republics is by riv., rail, or air. It takes a little over 3 days by water from Buenos Aires to Asunción, 56 hrs by rail, but only 4 hrs by air. The air route to Rio de Janeiro takes 6 hrs. The national telegraph connects Asunción with Corrientes and Posadas (2070 m.). Telephone lines cover 6330 m., and the system has been gov.-controlled since the end of the Second World War.

**Currency.** A monetary law of Oct. 1943 estab. the guaraní as the unit of currency. It is equal to 100 of the old paper pesos. The guaraní is divided into 100 centimos. It is symbolised by the letter G (crossed). There are no gold or silver coins current, but there are nickel, bronze, and aluminium coins of  $\frac{1}{2}$ , 1, 2, 5, 10, 25, and 50 centimos. In 1949 the free market rate was 3.73 guaraníes to the U.S. dollar; in 1957, 114.71, which it had reached after the 1954 devaluation.

**Towns.** The cap. is Asunción, pop. (urb.) 205,605; (dist.) 430,000. Other prin. tns: Villarrica, about 31,000; Concepción, 32,500; Coronel Oviedo, 33,100; Jesús Trinidad, 24,000; Caazapa, 20,000; Caragatay, 19,000; Encarnación, 16,000; San Pedro, 15,000; Paraguari, 12,000; Coronel Bogado, 11,000; and Pilar, ----.

**History.** P. was discovered by Sebastian Cabot in 1526, but the first colony there was settled in 1537 by Pedro de Mendoza, who founded the city of Asunción, and estab. the country as a viceroyalty of Peru. The war-like Guaraní long successfully resisted the invaders. In the latter half of the 16th cent. Jesuit missionaries arrived, and their work there for 150 years is one of the most marvellous in missionary hist. P. was the first republic to obtain its independence, and from 1814 to 1840 it was ruled by the remarkable despot, Dr Francia. He was succeeded by his nephew, Carlos Antonio López, who, dying in 1862, was succeeded by his son, Francisco López, an ambitious man, who organised a most efficient army, and seems to have aimed at becoming the arbiter of S. America. The other republics recognised the danger, and Brazil, Argentina, and Uruguay engaged in a long and sanguinary war against him, which ended in the defeat and death of López in 1870. The result was the ruin of P., whose pop. dwindled from 1,300,000 to about 200,000. Half a million of the people of P. are said to have been killed in the war with Argentina and Brazil in 1864. In 1912 the revolutions in progress were practically exterminating the male pop., and misery and desolation covered the land. Till recently peace was secured only by the advent or triumph of stronger political adventurers, and the duration of governments was short. Though the country had by no means recovered from these disasters, the pop. had again risen to over 1,000,000 when war broke out (1932-5) with Bolivia over the Gran Chaco (q.v. and see above).

During the Second World War the U.S.A. and Argentina both sought to influence the Paraguayan Gov., the latter being in the stronger position. In June 1946 pressure from the Paraguayan Army resulted in a modification of the gov., and the removal of all 'Nazi' leaders. President Morínigo remained on the understanding that he would revise his Cabinet, grant a general amnesty, and hold elections. But the delaying of these elections caused a revolt against him in Mar. 1947, which he was able to put down in Aug., with the help of Argentine arms. Its leaders having withdrawn into exile, it was safe for Gen. Morínigo to permit the presidential and parl. elections he had promised, and his nominee, Juan Natalicio González, a writer, was elected president (Feb. 1948). He was deposed after a few months, and during the series of short presidencies which followed the 'Colorado' party consolidated their hold on the state. The army head, Gen. Stroessner, became president in 1954; his regime was in many respects modelled on that of Perón (q.v.) in Argentina, and Stroessner offered Perón temporary asylum after the latter's overthrow in 1955.

See Sir R. Burton, *The Battlefields of Paraguay*, 1870; W. B. Grubb, *Among the Indians of the Paraguayan Chaco*, 1904, and *An Unknown People in an Unknown Land*, 1911; W. H. Koebel, *Paraguay*, 1917; W. Parker, *Paraguayans*

of To-day, 1920; A. E. Elliott, *Paraguay: Cultural Heritage, Social Conditions, and Educational Problems*, 1931; I. M. Sosa Escalada, *El Paraguay Occidental*, 1934; P. de Ronde, *Paraguay*, 1935; J. Vellard, *Une Civilisation du miel: Les Indiens Guayakis du Paraguay*, 1939; G. W. Harris, *Paraguay*, 1949; P. Raine, *Paraguay, a Riverside Nation*, 2nd ed., 1956.

**Paraguay River**, important riv. of S. America, an affluent of the Paraná (q.v.), rises in Mato Grosso in Brazil on a plateau of red sandstone. The P. takes a SW. course and, after flowing through a level country covered with thick forests, is joined from the W. by the Jaurú. It then flows S. through the marsh of Cáceres, and winds southwards, forming for a space the boundary between Brazil and Bolivia. It then pursues a SSW. course and passes through the republic of P. to join the Paraná a few miles above the tn of Corrientes. Its chief affluents are the Cuiabá, Tacuari, Mondégo, and Apá on the left, and the Jaurú, Pilcomayo, and Bermejo on the right; its total length is about 1800 m.; it is navigable for steamers to the mouth of the Cuiabá, 100 m. above the tn of Corumbá.

**Paraguay Tea**, see **MATÉ TEA**.

**Paraíba**, state on the NE. coast of Brazil, between Pernambuco and Rio Grande do Norte. Cotton-seed, cotton, oilcica oil, and tapioca are produced. Cap. João Pessoa. Area 21,730 sq. m. Pop. 1,713,260.

**Paraíba do Sul**, riv. in Brazil, which flows between the Sierra da Mantiqueira and the coast range of Rio de Janeiro, and is only partly navigable. Its valley, however, forms an important land-link with São Paulo. Length 600 m.

**Parakeet**, unscientific name for small long-tailed parrots, with a moderate beak and high, slender tarsi. Among the best known is the ring-necked P., which is very common in India and Africa, and in some dists. is a serious pest of agriculture. Its gay plumage and hardness make it a popular pet, and large numbers are exported. The crested ground P. or cockatiel is another hardy bird, and breeds readily in confinement. It and the undulated grass P. or budgerigar are natives of Australia; both are extensively kept as pets. A beautiful P. is the king P., which is about the size of a magpie and has a red head and breast and green wings.

**Paraldehyde**, colourless liquid (boiling-point 124° C.), obtained by adding a drop of concentrated sulphuric acid to acetaldehyde (q.v.). It has the formula  $(C_2H_4O)_3$ , and is used as a soporific (the so-called 'K.O. drops' of the crime novel). See also **HYFNOTICS**.

**Paraleipsis** (Gk *para*, beside; *leipein*, to leave) is a figure of speech in which a speaker or writer emphasises something by pretending to pass it over, usually with some such phrase as 'to say nothing of', or 'not to mention', e.g. 'King Gama made enemies by his vanity and ill nature, to say nothing of his spiteful tongue.' See also **FIGURE OF SPEECH**.

**Parallax**. The P. of a heavenly body

comparatively close to the earth, e.g. any member of the solar system, is the angle between two lines drawn to it, one from the observer on the earth's surface and the other from the earth's centre. Obviously if a body is in the observer's zenith these 2 lines will coincide, in which case the body has no P., and if it is on the horizon the angle will attain a maximum value, and is then known as the *horizontal P.* (H.P.). Between these 2 extreme values the P. will vary owing to the rotation of the earth, and the effect of P. is to increase a body's zenith distance. The *Nautical Almanac* and other similar pubs. give the positions of the heavenly bodies as if they were viewed from the centre of the earth, thus eliminating the effects of P. The moon's P. is the easiest to measure and the method adopted is similar to that used by a surveyor who measures a base line and two angles. If *O* and *O'* are two observatories, separated as far as possible, and *M* is the moon, by a method well known to astronomers the angles *MOO'* and *MO'O* can be measured, and as the length of the line *OO'* is known, the distances *OM*, *O'M* are easily found and also the distance *CM*, where *C* is the centre of the earth. When the distance of the moon or any other object in the solar system from the earth's centre is known, the H.P., denoted by *P*, is found from  $\sin P = a/d$ , where *a* is the earth's equatorial radius and *d* the distance of the object from the earth's centre. The same principle is used for finding the distances and hence the H.P. of planets, but owing to their greater distances from the earth the same accuracy is not attainable because small errors in the angles corresponding to *OO'M* and *O'M* involve relatively great errors in finding the lines corresponding to *OM* and *O'M*. The H.P. of the moon varies because our satellite describes an ellipse in its revolution round the earth, and hence its distance *d* varies; the mean H.P. of the moon is about 57', whereas the maxima for Venus and Mars are 31" and 24" respectively, and for those of the other planets (not including all the minor planets) less still. The method for finding the moon's P. already explained, is applicable also to the sun and is as follows. Kepler's third law (q.v.) states that the squares of the periodic times of any 2 planets, that is, of their times of revolving round the sun, vary as the cubes of their mean distances from the sun. The periodic time of a planet can be determined with great accuracy from observation, and the minor planet Eros has proved very useful to astronomers for finding the P. of the sun owing to its close approach at times to the earth. Its periodic time is about 1½ years, and its mean distance from the sun is 1.45 times the earth's mean distance. From these figures it is possible to derive the distance of Eros from the earth at any particular time in terms of the earth's mean distance from the sun—not in m. Now when Eros makes a close approach to the earth (say about 16,000,000 m.) its distance from the earth is measured in the same way as the moon's

distance and expressed in m., and hence the astronomer knows that a certain number of m. corresponds to a certain fraction of the earth's mean distance from the sun. From this he knows the earth's mean distance from the sun in m. Mr A. Hinks used this method when Eros made a close approach to the earth in 1900-1, and the then astronomer royal, Sir Harold Spencer Jones, also utilised it when Eros made a closer approach in 1931. The following approximate figures will show more clearly how the sun's mean distance from the earth, known as the astronomical unit (A.U.), is derived. Using Kepler's third law, the mean distance of Eros from the sun is 1.45 A.U. and on a certain date its computed mean distance from the earth was 0.17418 A.U. On the same date its distance from the earth, found by the same method that is employed for determining the moon's distance, was 16,200,000 m., and hence 1 A.U. is  $16,200,000/0.17418 = 93,005,000$  m. The H.P., derived from  $\sin P = a/d$ ,  $a$  being 3963.35 m., the earth's equatorial radius, and  $d$  93,005,000 m., gives  $\sin P = 0.00042614$ , or  $P = 8''.79$  nearly. Other methods for determining the distances of the sun and the planets will be found under appropriate headings. See ABERRATION; PERTURBATIONS; VELOCITY OF LIGHT.

**Stellar Parallaxes.** The earth's radius subtends such a small angle at the distance of the nearest star that it cannot be detected. A much longer base line is necessary, and this is provided by the diameter of the earth's orbit, which is about 186,000,000 m. A star is observed at each end of a diameter, an interval of 6 months intervening, and the principle is practically the same as that used in finding the moon's distance. At each end of the diameter selected, not only is the star photographed, but in addition another faint star in its field is also photographed, the presumption being that the fainter star is very far off—so far that it may be assumed at an infinite distance and hence lines drawn from the earth at each position of its orbit to this faint star are practically parallel. In these circumstances a displacement of the brighter star whose  $P$  is sought, relative to the fainter star, takes place, from which the angle subtended at the former by the diameter of the earth's orbit is easily found. This supplies the necessary data for finding the distance of the star. Many refinements are essential in the method, but the above gives the general principle involved, and when the distance of the star has been determined its  $P$  is supplied with the following implication. The  $P$  of a star is the maximum angle subtended at the star by the earth-sun line; when this line is not at right-angles to the sun-star line, reductions are made so that the  $P$  refers to the maximum angle. An example will show how stellar  $P$ —often referred to as *ann. P*—can be reduced to A.U.s and from this to light years. The  $P$  of Proxima Centauri, the nearest star to us, is  $0.783''$ , and using the formula  $\sin P = a/d$ , or  $d = a/\sin P$ ,  $a$  and  $d$  in this case denoting 1 A.U. and the

distance of the star, respectively,  $d = 1/0.00003796 = 263435$  A.U. Since 1 A.U. is 93,000,000 m., the distance in m. is 24.5 million million, or  $24.5 \times 10^{11}$ . A light year is  $5.88 \times 10^{12}$  m., and hence the distance of the star is about 4.2 light years. Various other methods besides the above trigonometrical method are used for finding the distances of the stars. See STARS, *Cepheid Variables*; SPECTRUM AND SPECTROSCOPE; METROLOGY.

**Parallax of the Fixed Stars,** see preceding article and STAR.

**Parallel Connection of electric circuits,** joining the circuits between the same terminals, the voltage being the same across each circuit. On d.c., if the circuits have resistances  $R_1, R_2, R_3, \dots$ , the currents will be  $\frac{V}{R_1}, \frac{V}{R_2}, \frac{V}{R_3}, \dots$  and the total current  $V \times \left( \frac{1}{R_1} + \frac{1}{R_2} + \dots \right)$ .

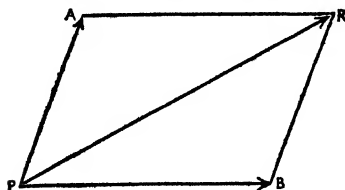
On a.c., if the admittances (q.v.) be  $G_1 + jB_1, G_2 + jB_2, \dots$ , the currents are  $V(G_1 + jB_1), V(G_2 + jB_2), \dots$ , the total  $V(G_1 + G_2 + \dots) + jV(B_1 + B_2 + \dots)$ . Connecting 2 d.c. generators in parallel to supply a load, the terminals must be joined by an "equalizing bar" to prevent the voltage of one dynamo dropping below that of the other, in which case it would be driven as a motor. Alternators must first be synchronised (see SYNCHRONISER). With 3-phase transformers care must be taken to connect the phases in correct sequence. Only transformers with the same transformation ratio can run in parallel.

**Parallel Roads of Glen Roy.** In the valley of the R. Roy in Invernessshire, 3 narrow terraces can be seen one above the other on the valley slopes. These terraces, which are known as the Parallel Roads, are natural features representing the beach deposits of a lake which filled the glen at a time when its outlet was blocked by ice during the Pleistocene glaciation. As the ice-front retreated, the water level of the lake sank, and terraces were formed at successively lower levels.

**Parallelepiped,** solid figure having 6 faces, all parallelograms, any 2 opposite being similar and parallel; the edges equal and parallel on opposite faces, the diameters meeting in a point. With square faces it becomes a cube. The ordinary rectangular box is another form. The volume is the product of the area of any face as base and the vertical height between it and the opposite face.

**Parallelogram of Vectors.** Vectors (q.v.), such as forces, velocities, and displacements, can be represented graphically by straight lines parallel to the directions of the vectors and having lengths proportional to their magnitudes. If 2 vectors are represented in magnitude and direction by 2 sides of a parallelogram drawn from a point, then their resultant is represented in magnitude and direction by that diagonal of the parallelogram which passes through the point. In the figure, PR is the resultant of the 2 vectors represented by PA and PB.

Similarly, the resolved parts of a given vector in 2 directions can be found by constructing a parallelogram with its diagonal parallel to and of a length pro-



portional to the given vector and with sides parallel to the 2 directions. Thus, in the figure, PA and PB are the resolved parts in the directions PA and PB of the vector PR.

**Paralysis**, or **Palsy**, in medicine, denotes the loss of power of movement, but applies also to loss of function; incomplete P. (diminished power) is known as *paresis*. There are 3 classes: *cerebral*, *spinal*, and *peripheral*. Cerebral P. arises from destruction of motor nerve cells of the surface of the brain, or from interruption in the nerve fibres leading to the spinal cord. 'Hemiplegia' is characterised by unilateral P. of the body in the legs, arms, etc., with aphasia (loss of speech), if on the right side. The facial muscles and tongue are generally affected, the eyelid and mouth drooping. Cerebral P. usually follows ruptured blood-vessels or thrombosis (q.v.) or embolism (q.v.). See **APROPLEXY**. Tumours, abscesses, fracture of the skull, epileptic fits, or hysterical fits may be the cause. Recovery may take place if the paresis results from pressure only but such is not common. Spinal P. is due to pressure, interruption, or destruction of the nerve cells or fibres in the spinal cord or those passing to the muscles. Sensory P. is more often found than in the cerebral form, where 'hemi-anæsthesia' is unusual. In 'paraplegia' both sides of the body are affected in certain areas depending on the position of the lesion in the spine; reflex movements may remain unaltered; motor areas on one side and sensory on the other may be affected. Spinal P. in its onset is seldom marked by convulsions, but it is often characterised by progressive wasting of muscles. Peripheral P. arises from affection of the nerves or muscles. Facial P. (Bell's P.) is due to affection of the seventh cranial nerve caused by disease of the ear, or exposure to draught. Lead palsy is characterised by 'wrist drop,' with affection of the muscles of the forearm. 'P. agitans,' the form in old age, is accompanied by tremors, loss of equilibrium and rigidity. 'Diphtheritic P.' is an affection of the structural protoplasm due to the toxins of the diphtheria bacillus. 'Birth P.' in its various forms, often in the legs and feet, is of frequent occurrence owing to difficult labour and consequent injury to the brain or spinal cord. 'Bulbar P.,' a rapidly fatal form, affects the

speech and centres of deglutition; it springs from the *medulla oblongata*. P. is usually accompanied by flaccid muscles, though there may be temporary rigidity; the muscular fibres are replaced by contractile connective tissue, and the limbs become permanently bent and immobile. Traumatism, embolism, hæmorrhage, tumour, and thrombosis are the chief causes; alcoholism and syphilis and other diseases affecting the circulatory system are also among the causes. Infantile paralysis (q.v.) (*poliomyelitis*), which affects the motor areas in the grey matter of the spinal cord, is a virus infection which is a further cause of P.

**Treatment** of P. depends upon its cause and upon the anatomical site of the affected muscles. It must also depend upon the patient's general condition. The general aim, without overtaxing the patient, should be to keep the paralysed muscles in as healthy a condition as possible so that they may more readily assume their function if and when the nerve lesion recovers. In particular, deformities arising from stretching of the paralysed muscles should be guarded against by splinting and other means. Physiotherapy, massage, and passive movements are helpful. The patient should be encouraged regularly to perform whatever movements he is capable of. Mental depression and intellectual deterioration need to be combated, and thought should be given to ways and means of stimulating interest in matters unconnected with the illness. Occupational therapy is helpful and, above all, the patient must be made to feel that despite his handicaps he still has a useful function in society. Great care must be taken to guard against pressure sores, which are a frequent source of trouble in those who are unable to move their position.

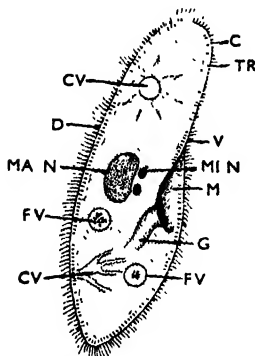
**Paramagnetic**, see **INDUCTION**, **MAGNETIC**.

**Paramaribo**, cap. and chief port of Surinam (Netherlands Guiana), on the Surinam R., 15 m. from the sea on a former coastal shell reef, and 214 m. from Georgetown, Brit. Guiana. It is the centre of the colony, and is on air routes between the U.S.A., Brazil, and the Netherlands. There is a deep-water frontage of a mile. In general appearance it is a city of old Dutch buildings and tree-lined streets. The old Government House on the Wilhelmina Square is of Georgian appearance. A neighbouring side is graced with a handsome statue of the queen. The 17th-cent. Fort Zeelandia is a reminder of a former age. A single-track railway runs to Kabelstation (83 m.). Pop. 86,000.

**Paramatta**, see **PARRAMATTA**.

**Paramecium**, or **Slipper Animalscule**, one of the group of Protozoa formerly known as Infusoria, but now classified as Ciliata. The name Infusoria (q.v.) was originally applied to these and similar organisms because they were observed in infusions prepared from such organic substances as hay, seeds, etc. The group is now limited to those protozoa which have a permanent

investing pellicle, a large and one or more small nuclei, and an arrangement of cilia by which they move about. One section of the ciliata includes organisms which are usually ciliated only in the young state and acquire their food from the surrounding medium by suction; these are known as *Suctoría*. The remaining members of the ciliata comprise organisms permanently provided with cilia, and it is to this group that the P. belongs. The P., as its alternative name suggests, is shaped like the sole of a slipper, but is only about 0.01 in. long. The surface is provided with rows of cilia arranged longitudinally. The cell is surrounded by a definite pellicle, and contains within its body food



PARAMECIUM, THE SLIPPER ANIMALCULE

A, anterior end; C, cilia; CV, contractile vacuole; D, dermis; MA N, macro-nucleus; MI N, micro-nucleus; FV, food vacuole; G, gullet; M, mouth; P, posterior end; TR, trichocyst; V, vestibule.

vacuoles formed by the particles of food collecting bubbles of water about them as they pass from the oral cavity into the endoplasm; the food passes in an elliptical path through the endoplasm and becomes gradually digested. There are also 2 contractile vacuoles which function alternately and act as osmotic organs. Water is constantly absorbed by osmosis over the whole pellicle, and these vacuoles suddenly contract and forcibly expel it. Experiments made to show that the function of these vacuoles is excretory have so far failed. The P. provides itself with food by lashing the water with its cilia. These also serve as an organ of locomotion, the cell taking a peculiar zigzag path at a constant angle to the general direction of its motion. The food is directed into a funnel-shaped 'mouth,' within which is a thin membrane. This, by its movements, aids the direction of the food into the animal. Reproduction is effected by fission and by conjugation.

In the former case, first the smaller or micronucleus, then the larger or meganucleus, become constricted and divide into two by oblique division, and the missing organs in either part are quickly regenerated. It is observed that frequent multiplication by fission diminishes the vitality of the organism and is succeeded by conjugation, when two exchange part of the substance of their nuclear apparatus and so obtain a new lease of life. When conditions become unfavourable the animals encyst themselves.

**Paraná:** 1. City of Argentina, cap. of the prov. of Entre Ríos, on the P., facing the tn of Santa Fé, 235 m. NW. of Buenos Aires. It is the centre of a grain-growing dist. For 9 years from 1853 the city was the cap. of the Argentine. The chief objects of interest to visitors are the governor's palace, the cathedral, and the Urquiza Park. P. is a bishop's see and the seat of a univ., and a thriving riv. port. Pop. 83,800.

2. Coastal state of S. Brazil, between Paraguay and the Atlantic. W. of the low-lying coastal strip are the mts of the Serra do Mar (c. 3000 ft). Timber, cereals, rice, fruit, and cotton are produced, and there are coal deposits. Many of the farmers are of It., Ger., or Slavonic origin. Cap. Curitiba. Area 77,717 sq. m. Pop. 2,115,547.

3. One of the most important rivs. of S. America, formed by the confluence of the Rio Grande and the Parnaíba. The Rio Grande rises in the state of Minas Gerais, Brazil, and flows NW. and W. to the point of confluence. As the P. the 2 rivs. then flow in a SW. direction through Brazil, then S., forming the boundary between Brazil and Paraguay. Thence it sweeps W. between Paraguay and Argentina to receive its prin. trib., the Paraguay. It then flows SW. to Rosario and SE. to unite with the Uruguay in the Plata estuary. Cataracts and rapids render it unfit for navigation over a large part of its course, but for the last 1000 m. it is always navigable even by large steamers. Its total length is about 2500 m., excluding the Rio Grande, its true headstream.

**Paranáguá,** chief seaport of the state of Paraná, S. Brazil, 55 m. E. of Curitiba. It is situated on a lagoon-like bay of the same name; its quay is small but modernised. Coffee, sugar, spice, and maté are exported, as well as bananas, maize, pine-wood, and other products. The port dates from the colonial period, and in the tn there are some historic churches. The rail journey to São Paulo is 660 m. Pop. 13,000.

**Paranola,** see **INSANITY (CLASSIFICATION).**

**Parapet** (from the It. *parapetto*), low or breast-high wall or fence, as a protection on bridges, terraces, flat roofs, etc. In Renaissance architecture P.s are generally balustrades. In Gothic architecture the P. is merely a continuation of the wall carried up above the edge of the roof and finished by a coping unless machicolated, in which case it projects



and overhangs the walls below. In the Lombardic buildings of Italy, and also in the Norman style, there is seldom any P., the eaves of the roof finishing the elevation. In Elizabethan buildings open-work P.s. sometimes formed of carved inscriptions, are common.

**Paraphrase** (from Gk *para*, beside, and *phrazein*, to tell), name given to a restatement of a passage in prose or verse, so as to bring out its meaning with greater lucidity, without altering the sense of the original by change, addition, or subtraction. In music a P. is a free adaptation of a piece of music so as to suit it to other instruments. The metrical arrangements of portions of Scripture which are sung with the psalmody in the Scottish Church are called P.s.

**Paraphrenia**, see under INSANITY (CLASSIFICATION).

**Paraprosdokian** (Gk *para*, against; *pros*, towards; *dokein*, seem) is a figure of speech in which an unexpected turn is given to a sentence, especially in the form of a sudden bathos (q.v.), as in the line quoted by Aristotle, 'Statefully swept he along, and under his feet were his chilblains.' See also FIGURE OF SPEECH.

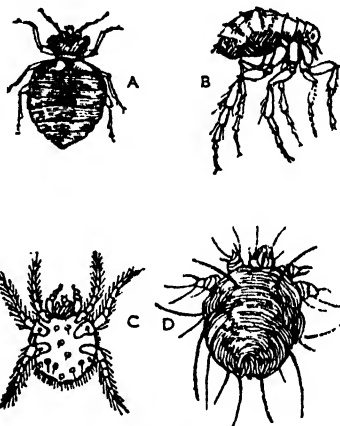
**Parapsychology**, see PSYCHICAL RESEARCH; PSYCHOLOGY.

**Paraselenae**, see MOCK SUNS AND MOONS.

**Parasites** (Gk *parasitos*, one who eats beside, or at the table of another, or at another's expense), living organisms which pass the whole or a part of their existence on or in other living organisms or hosts without conferring any benefit. They do this essentially for the purpose of obtaining nourishment from their hosts, not merely for shelter. In recent years numbers of instances have been observed where one creature is in intimate association with another purely as a commensal (q.v.). For instance, small sea-anemones are transported in the claws of 2 species of crabs, which take any food the anemones cannot completely swallow. The anemones probably gain from the transportation more opportunities of catching prey. Some small fishes shelter themselves beneath the 'umbrella' of large jelly fishes, others in the gullet of large sea-anemones, and one in the hind gut of a sea-cucumber. But in none of these and other similar cases does one of the commensals live or rear its young at the expense of the other, and hence they are not termed P. These are, however, of considerable interest as indicating how in many cases a parasitic life was entered upon, and one view of symbiosis maintains that it is the perfection of parasitism.

Until parasitology became an estab. science, attempts were made to classify P.: there were Ectozoa, or P. which live on the surface of the host, and Endozoa, which live in the blood or internal parts; but this is artificial, and the only satisfactory classification is along biological lines. (For plant- or phyto-P. see PARASITIC PLANTS.) The gradation of the symbiotic into the ectoparasitic habit is well illustrated by different barnacles. *Balanus* lives almost indifferently as a

commensal on various animals such as whales, crabs, and sharks; but *Anelasma*, living on the shark, sends haustoria into it, and thus establishes itself as an ectoparasite. Having adopted this mode of life, *Anelasma* has apparently to be maintained by sharks or to die, for it is unable to make other animals its hosts as indifferently as *Balanus* makes them commensals. In this way biological species of both plant and animal P. have been estab. From these examples where the prey or host is quickly destroyed, there is every degree of elaboration up to the stage of such perfect and (at any rate in the adult stage) harmless parasitism as those which merge into symbiosis.



SOME EXTERNAL PARASITES

A, bed bug  $\times 4$ ; B, flea  $\times 6$ ; C, harvest mite  $\times 6$ ; D, itch mite  $\times 20$ . (See also the illustration to LICE.)

The absence of serious injury by a parasite points to a long period of natural selection in which, on the one hand, the parasite has been brought to some degree of harmlessness, and, on the other hand, the host has become able to tolerate the parasite without being injured or poisoned by it. Some avoid killing the host only while their dependence upon it is essential. A caterpillar, for example, in which an ichneumon fly has laid her eggs, does not die until it has passed into the pupal stage when the grubs of the fly which have fed upon it have become full grown and have also pupated. As parasitism becomes more pronounced, definite structural features are evolved, such as hook-like claws or suckers for secure attachment to the host and cuticles that are adequately protected against the action of digestive juices—to such a high degree indeed of adaptation is evolved this power of tolerating the chemical qualities of the gastric juice, that some P. are poisoned

and destroyed if they gain admission to hosts of species other than those to which they have accustomed themselves. There are remarkable instances of this in the case of the microscopic parasite which causes malaria, and which can be conveyed only by the mosquito (*Anopheles*); it is destroyed in the system of other gnats. Similarly, the ciliated embryo of the liver fluke refuses to enter any snail other than *Limnaea truncatula* and also, according to recent work, young specimens of *L. stagnalis*, as an intermediate host. Motor and other organs become atrophied as in the wingless insects (e.g. fleas) which have adopted parasitic life, while in the leech the alimentary tract is considerably simplified, and in the tapeworm the digestive system is completely aborted, as to a large extent are the nervous and sense organs. A large proportion of the so-called Entozoa require more than one host in which to complete their life-history. The host in which the adult reproductive stage is reached is the 'ultimate' or 'definite' host, and that in which the life-history is begun with the entrance of the ova or newly hatched larvae is the 'intermediate' host. For instance, the embryos of the tapeworm, picked up by pigs with their food, become encysted in their muscles, causing 'measly' pork, which if not properly cooked introduces the tapeworm to the intestines of man, where it passes into the adult stage. To counteract the slender chances of the completion of the life-history, which in the case of the liver fluke passes through 7 distinct stages, many P. are extraordinarily prolific. A single tapeworm (see CESTODA), for example, produces some 75,000,000 young, of which perhaps, on the average, not more than one becomes estab. In its ultimate host. It is doubtful if any vertebrate is a true parasite, though the lamprey-like hagfish (*Myxine*) cuts its way into the turbot, cod, and other fish, where it is often found by fishermen; but its stay in the body of its victim is short. The highest P. of importance in the animal kingdom are the various Arachnids, which include the numerous mite species. Among insects P. are numerous, and with them may be mentioned aphides, or plant-lice, the gall-wasps and gall midges, and many others parasitic on plants.

As an instance of the artificiality of the classification of P. as external and internal, there is the instance of *Ascaris megalocephala*, which lives in the intestine of the horse and is usually described as an endoparasite. Since, however, no penetration of cells is involved, it seems better to regard organisms living in the gut as ectoparasites, and those in the cells or blood stream as endoparasites. Among flat worms or Platyhelminths, and round worms, or Nematodes, parasitism is very frequent and gives rise to a number of serious diseases. The Sporozoa—a class of the Protozoa or unicellular animals—include a large variety of parasitic organisms of such importance as those that cause malaria, sleeping sickness, and amoebic dysentery. P. are

usually described as degenerate, but the criterion of degeneracy needs first to be clearly estab. Viewed structurally, P. are usually much simpler than related free-living forms. They have evidently lost the complex structure once possessed, so that if complexity be a criterion, P. are usually highly degenerate. *Sacculina* and *Pellogaster*, for example, are little more than ova-producing structures. If, however, success be a criterion, most P. are better described as highly specialised rather than a degenerate, for they may be regarded as highly successful, and they have elaborate reproductive organs. The Nematodes, well advanced in parasitic habits, are very widely distributed and very numerous. The food of the parasite is often pre-digested by the host; consequently a simple alimentary canal or absorptive area is sufficient for the parasite. It is often transported by the host, and therefore needs no organs of locomotion, unless a free-living phase occurs in its life-history. Even in this case the organs of locomotion are usually ill-developed, since they are little used. Thus degeneracy of structure is correlated with adaptation to the mode of life, and it may be questioned whether adaptation is degeneracy. The degeneracy here appears to be an ethical question rather than a biological one.

Although P. are frequently highly successful, their hosts suffer considerably. Even when P. have estab. some sort of harmony with the host, to the extent that the host continues to live, there is frequently a reduction in size, and a disturbance in metabolism sufficient to effect sex reversal occurs when the crab is parasitised by *Sacculina* or by *Pellogaster*. Parasitism is a highly specialised mode of life favourable to the parasite, but, at best, harmless to its host. At its worst, it destroys the host, but this usually indicates the beginning of a parasitic career, or an attempt to parasitise a new host. See also BACTERIA; CESTODA; PATHOLOGY; SYMBIOSIS, and articles on individual P.

See A. M. Kennedy, *Parasitology for Medical Students*, 1925; C. Fox, *Insects and Disease of Man*, 1926; P. A. Maplestone, *The Nematode Parasites of Vertebrates*, 1926; R. Hegner, *Host-parasitic Relations between Man and his Intestinal Protozoa*, 1927; E. Brumpt, *Précis de parasitologie*, 1927; R. Hegner, F. M. Root, and D. L. Augustine, *Animal Parasitology*, 1929; D. and C. T. Rivas, *Clinical Parasitology and Tropical Medicine*, 1935; and A. C. Chandler, *Introduction to Human Parasitology* (7th ed.), 1945; T. Goady, *Soil and Freshwater Nematodes*, 1951; J. G. Baer, *The Ecology of Animal Parasites*, 1951; M. Rothschild and T. Clay, *Fleas, Flukes and Cuckoos*, 1952.

**Parasitic Plants.** A large number of plants, especially fungi, have developed parasitic habits, some of which are the cause of serious loss to cultivated plants and trees. The number of Brit. phanerogamic (flowering) parasites is small; the dodders (*Cuscuta*) are the only ones of serious economic importance, often doing

considerable damage to crops of clover and lucerne, into the tissues of which they send suckers. After germination a seedling dodder can live independently for 2 or 3 weeks; but if within that time it has not found a suitable host, it perishes, as the entire absence of chlorophyll prevents it from utilising inorganic food. The broomrapes (*Orobanchae*) are so dependent on their hosts that unless in contact with them the seeds cannot germinate. The toothwort (*Lathraea squamaria*) is also destitute of chlorophyll, but is said to supplement the food appropriated from the roots of various broad-leaved trees (e.g. hazel and elm) by animal organisms which get into small cavities in the leaves. In these cavities are glandular cells similar to those of certain insectivorous plants, but there is no conclusive evidence of the function of these cells. The mistletoe, eyebright, yellow rattle, and cow-wheat are partial parasites, for all these plants contain chlorophyll and can assimilate carbon dioxide, though dependent upon their hosts for water and salts. Among the fungi, the rusts and smuts do considerable damage to cereal crops; the mildews to hops, grape vines, gooseberry plants, and various fruit trees. *Phytophthora infestans* is the cause of potato blight, which led to the Irish potato famine in 1846-8. Ringworm and other skin diseases of man are caused by parasitic fungi (see ACTINOMYCOSIS; FUNGI). Most extraordinary of the numerous P. of the tropics is the huge-flowered *Rafflesia*, which grows on the *Cissus*; the flower, said to measure a yard in diameter, is the largest known. See F. T. Brooks, *Plant Diseases*, 1953.

**Parasitology**, the scientific study of parasites (q.v.).

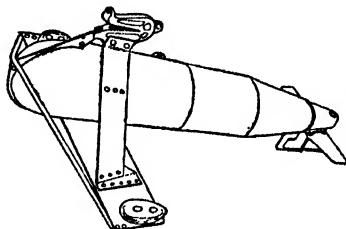
**Paratoluidine**, see TOLUIDINE.

**Paratroops**, see PARACHUTE AND AIRBORNE TROOPS.

**Paratyphoid Fevers**, see ENTERIC FEVER.

**Paravane** is a device developed by Commander Usborn and Lt. (later Sir Dennistoun) Burney during the First World War as a protection for ships from mines. It consists of a cigar-shaped body made of welded steel plate. At its nose-end it carries an eye for a towing-cable, a fixed cutter for cutting the moorings of a mine, and a small steel plane for stability. At the tail-end are 2 rudders actuated by a hydrostatic valve, which controls the depth at which the P. is required to run; also small horizontal and vertical fins. A P. is towed on each side of a ship by steel ropes attached to the stem and is adjusted to run slightly below the level of the keel—about 50 ft from the ship's side and about 180 ft from the stem, depending on the length of the vessel. The towing-cable thus forms a wedge which when it comes in contact with the mine mooring-wire deflects the latter away from the ship and leads it to the powerful cutter on the P., where it is severed, thus permitting the released mine to rise to the surface, when it can be destroyed. There is no danger of a ship registering a direct hit with its stem on a mine, owing to the cushion of water

which a ship's stem pushes in front of her having the effect of deflecting the mine to one side or the other. Another type of P. contained explosives and was developed in 1916 to destroy submarines whose positions were approximately known. It was towed at high speed by the attacking vessel, and the charge could be fired by electricity or automatically on the P. striking its target. But, with the development of asides, the P. as an anti-submarine weapon became obsolete and is used to-day only as a protective device.



**Paray-le-Monial**, Fr. tn in the dept of Saône-et-Loire, on the Canal du Centre. It is a place of pilgrimage; here Marguerite-Marie Alacoque advocated devotion to the Sacred Heart (see SACRED HEART OF JESUS). There is an agric. market, and pottery and oil industries. Pop. 7800.

**Parcae**, see MOIRAE.

**Parcel Post**, see POST OFFICE.

**Parceners**, see CO-PARCENERS.

**Parchim**, Ger. tn in the dist. of Schwerin, on the Elbe, 22 m. SE. of Schwerin (q.v.). It has paper, foodstuff, and distilling industries, and was the bp. of Moltke (q.v.). Pop. 20,000.

**Parchment** (from *pergamena*, or Pergamum, where P. was first used for writing on instead of papyrus, q.v.), skin of the sheep, lamb, goat, pig, or calf, prepared for writing upon. When the skin is divested of its hair or wool, it is placed for some time in a lime-pit, and then stretched on a square wooden frame drawn tight by pegs. When in the frame it is first scraped on the flesh side with a blunt iron, then wetted with a moist rag, covered with pounded chalk, and rubbed well with pumice-stone. After a short pause these operations are repeated, but without chalk. The skin is then turned and scraped on the hair side once only. The flesh side is scraped once more, and again rubbed over with chalk. All this is done by the skinner, who allows the skin to dry in the frame, and then cuts it out and sends it to the parchment-maker, who repeats the operations with a sharper tool, using a sack stuffed with flocks to lay the skin upon instead of stretching it in a frame. See also MANUSCRIPTS; PERGAMUM; VELLUM.

**Parcimony** (Lat. *parcimonia*), The Law of, in philosophy, the rule that complex

powers, principles, or causes are not to be postulated without necessity, but that the simplest hypothesis is to be preferred. The law is enunciated by Wm of Ockham in the famous phrases—'Entia non sunt multiplicanda praeter necessitatem. Frustra fit per plura quod fieri potest per pauciora.' The first maxim (known as 'Ockham's razor') is aimed at the hypothesizing of abstractions, an error which he attributes to the Realists. See HYPOSTASIS; NOMINALISM.

Pardo Bazan, Countess Emilia (1852-1921), Sp. novelist and critic, b. Corunna, Galicia. Her title was granted by Alfonso XIII, and she was the first woman to be made counsellor of public instruction. She wrote numerous novels, the best dealing with Galicia, books on Fr. and Russian literature and travel, and collections of short stories and essays. Her most outstanding works are *Los Pazos de Ulloa*, 1886, a vivid portrayal of Galician country life; and *La Madre Naturaleza*, 1887. See E. González Lopez, *E. Pardo Bazan, novelista de Galicia*, 1944.

Pardoe, Julia (1806-62), novelist, historian, and travel writer, b. Beverley, Yorkshire. She visited Portugal and wrote on her return *Traitor Traditions of Portugal*, 1833. A visit to Constantinople supplied material for *The City of the Sultan*, 1836, and *A Romance of the Harem*, 1839, and after going to Hungary she wrote *The City of the Magyar*, 1839-40. Later works were *Louis XIV and the Court of France*, 1847, and *The Court and Reign of Francis I*, 1849.

Pardon. In the United Kingdom the home secretary in the exercise of the royal prerogative (see CROWN) has the right to pardon offenders against the criminal law. A P. cannot be granted where private interests are mainly concerned in the prosecution of the offender (a principle which explains the obsolete rule that the Crown could not pardon a man 'appealed', of felony). For example, the Crown will not pardon a common nuisance while it remains unabated. Again, under an Act of Charles II, the Crown cannot pardon a person guilty of committing a man to prison out of the realm. It is the better opinion that the crown cannot pardon where the effect would be to nullify the effect of a recognisance to keep the peace; nor again is it the practice to pardon a contempt of court to the prejudice of the rights of a subject. A P. may be absolute so as to put the offender in the same position as if he had been innocent all along, or conditional, e.g. when a person sentenced to death is pardoned on condition that he submit to having his sentence commuted to penal servitude. In form a P. is granted by warrant under the great seal or under the sign-manual (qq.v.). Under the Act of Settlement no P. under the great seal can be pleaded to an impeachment by the Commons. In the U.S.A. the constitution gives the president the power to pardon offences against the U.S. Gov. except in the case of the impeachment of public officers.

Pardubice: 1. Region (*kraj*) in Central

Czechoslovakia, part of the former prov. of Bohemia (q.v.). It is mountainous in the S., and is watered by the Labe (see ELBE). Area 1,633 sq. m. Pop. 423,000.

2. (Ger. Pardubitz) Czechoslovak tn, cap. of the region of P., on the Labe. It has petrol refineries, manufs. radio and telephone equipment, and has a trade in grain and timber. Pop. 44,000.

Paré, Ambroise (1510-80), Fr. surgeon, b. Laval, Maine, France. Although his parents were poor, he went to study surgery at Paris. He gained a great reputation during the Fr. campaigns in Italy, and was made surgeon-in-ordinary to Henri II. P. was the greatest of the army surgeons before Larrey (q.v.). He abandoned boiling oil and the cautery, until then used in the treatment of wounds, introduced artificial limbs, made improvements in obstetrical procedures, and invented many new surgical instruments. An Eng. trans. of his works appeared in 1634; the best Fr. ed. is by J. F. Malgaigne, 1840-1. See lives by S. Paget, 1899, and F. R. Packard, 1926.

Parent and Child. By Eng. law the complete relation of P. and C. exists only where the child has been born in lawful wedlock or where it has been legitimated by the subsequent marriage of the parents (see LEGITIMATION). There is no obligation on either parent at common law to maintain a legitimate child, though indirectly he or she could be compelled to do so through the old Poor Law Statutes, the Vagrancy Acts, and the Cruelty to Children Acts (see CHILDREN AND YOUNG PERSONS). An illegitimate child, whose parents have not married each other, is primarily maintainable by its mother, though if its paternity be proved an affiliation order can be obtained against the putative father compelling him to pay for the child's maintenance and education a sum not exceeding 20s. a week, until the child is 16. No person is required as father of an illegitimate child to give information concerning its birth, and the registrar of births and deaths may not enter in the register the name of any person as father of the child unless at the joint request of both parents. The effect of the Poor Law statutory obligation as re-enacted by the National Assistance Act, 1948 (Section 42), is that a husband is bound to support all his wife's children, whether legitimate or illegitimate, which she had when she married him, in addition to those he himself may beget by her.

Legitimate. Legitimacy by birth depends on the lawful marriage of the parents and the fact that the child was born in wedlock, though it is immaterial how soon after the marriage the birth takes place. In Scots law the position has for long been that children otherwise illegitimate may be legitimated by the subsequent marriage of their parents. The prin. effect of legitimacy is the right of the child to inherit and take his parents' real estate and personal estate respectively, though there is nothing to prevent the parent from willing away from his own issue the whole of such

property as does not form the subject of a settlement. The other results of legitimacy are the right to bear the father's name, and, to the extent indicated, the right to be maintained, educated, and protected. The parents are the natural guardians of their children, and their control endures in ordinary circumstances until the child reaches 21 or marries under that age. But the father is the legally favoured parent, a pre-eminence the principle of which found its strongest expression in the *patria potestas* of the Rom. father of an agnatic family (see HEIR). In England the father has the right to the custody and control of the children, not only as against third parties but against the mother, even though the child be at the breast; but this exclusive right of the father has been so far modified by the Divorce Acts and the Infants Custody Act, 1873, that the court will, on the mother's petition, give her either access or complete control where it is clearly for the benefit of the child to do so. Under the Guardianship of Infants Act, 1886, the mother has the right to appoint by deed or will a guardian to act after her death, who will be entitled to act either alone or jointly with any guardian the husband may have appointed. The Adoption of Children Act, 1926, however, provides for the adoption of infants by applicants who must not themselves be under 25 years of age or less than 21 years older than the infant they are applying to adopt. Before granting an adoption order the court must be satisfied that every person (and this includes the natural parents) whose consent is necessary to the order both consents to and understands the nature and effect of an adoption order and, in particular, that the effect will be permanently to deprive him (her) of his (her) parental rights; and the court must also be satisfied that the order will be for the welfare of the infant. It is obvious that the only cases likely to arise are those in which the applicant(s) has already been maintaining the infant in his (her) own home. Prior to 1926 the law would not allow parents to enter into an agreement binding themselves to surrender the custody of their children; and if they had, in fact, given up control to third persons, they could at any time resume control subject to any doubt the court might entertain as to whether it would be for the child's benefit that it be taken away from the care of those who had actually reared it. In any case, if the child has been brought up by another person, or is boarded out by Poor Law or equivalent authorities, the court may make an order on the parents, if it restores the custody to them, to pay such remuneration for the past maintenance as may be just. Where any dispute arises between the parents as to the question of custody, and the child, if a boy, is not less than 14 years of age, or, if a girl, not less than 16, the court may allow the child to exercise a discretion and withdraw itself from the control of one or both of its parents. Where the husband and wife have separated and drawn up a deed of separation, providing

that the mother have access or full custody, the father will be bound by his agreement. Parents have a legal right to give or withhold consent to an infant child's marriage (see INFANT); such consent must be given honestly and without any view to the parents' own private advantage. It is almost needless to say that the right is of no great value, and that the absence of consent will not invalidate a marriage ceremony which is otherwise good, whatever effect it may have in debarring the disobedient child from succeeding to property or from other material benefits.

Under the former Poor Law Act of 1601 there was mutual obligation of maintenance on children and parents; but though grandparents might be compelled to maintain pauper grandchildren, the converse did not hold good. But under the National Assistance Act of 1948 the only responsibility now is that of parents to children. By the Children Act, 1908, the wilful neglect on the part of a parent to provide his child with adequate food, clothing, medical aid, or lodging, or to take steps to procure the provision of the same from the Poor Law authorities (now the National Assistance Board), is misdemeanour, for which he may be punished either summarily by a fine up to £25, with or without imprisonment up to 6 months, or on indictment by a fine up to £100, with or without imprisonment up to 2 years. When an order for maintenance is made against a soldier husband, it must be sent to the War Office, which dept may then order a certain part of his pay to be deducted and appropriated to the support of his children. The absence of any civil obligation to maintain is important in connection with the liability of parents for necessities supplied to their children under 21. A father who gives no authority, *a fortiori* who enters into no contract, is no more liable for goods supplied to his children than would be a mere stranger, though, of course, a jury is not unnaturally disposed, from his moral obligation to provide for his children, to infer an admission of liability in respect of such claims upon his children by tradesmen. But apparently mere knowledge on the part of the father that his child is being maintained by a stranger will not be enough to fix him with the liability to pay for the necessities supplied by the stranger on the ground of tacit acquiescence; it would be otherwise if he had deserted his child or it was in a destitute state, for in such cases the law always implies a liability to repay a stranger for necessities supplied.

Before the Elementary Education Act, 1876, it was not obligatory on a parent to have his child educated. Under that Act it is his duty to cause it to receive efficient elementary education in reading, writing, and arithmetic, subject to any reasonable excuse for not sending his child to school, e.g. on the score of ill health (see also EDUCATION). Rich and poor fathers are alike in this, that neither is legally bound to do more than cause his

child to receive a statutory elementary education. If, however, the child is under the custody of guardians, the latter are bound to educate him in a manner becoming his rank and station in society. Again there is no obligation on a parent to bring up his child in any particular religious creed, or indeed to instill any religious views in him at all. The father, however, has the right to choose in what religion the child is to be educated, *even though it be illegitimate and un-legitimated*, and he cannot release this right or bind himself conclusively to bring his child up in a particular faith, for the right is to be exercised not for his but for the child's benefit. Apparently a father cannot directly secure in what religion his child shall be brought up *after his death*, but he can accomplish the same object by choosing the right testamentary guardian.

A father acquires no legal interest in any real or personal property that may be given to or settled exclusively on his child, whether such property accrues to the child while under age or after majority. In ancient legal systems, like the Roman, children were unable for the most part to hold any property separately from their fathers (*see* *HEIR*). It seems a moot point whether a father is entitled to the earnings of his child. Much must depend upon the implied terms of any arrangement that may be supposed to have been made between them. If the father, after the child reaches a certain age, sends him out to work but undertakes to continue his board and lodging, it may be assumed that he does so only on the understanding that the child's earnings will be 'pooled' for the common benefit of the family. But there is nothing to prevent a child from making a formal contract with his father as to wages if he enters his father's service, and such contract would be enforceable against the father. Of course, if the father frees the child from his control he has no longer any hold over the child's earnings. A widow, being bound to support any children she has who are under 16, has a corresponding right to their earnings (as to the law of succession on intestacy see between P. and C., *see* *SUCCESSION, INTESTATE*). A child may make a gift to his parent, provided the gift is not tainted by any undue influence on the part of the parent; and conversely a parent's gift to his child gives the latter an exclusive property in the gift as if made over to him for valuable consideration. Further, a voluntary settlement is binding on the parent, and can, if necessary, be specifically enforced by the children (*see also* *PORTIONS; LAND LAWS; HORTHOPE*). A child is under no legal obligation to support his parents, even though he may be in receipt of a handsome income and his parents be scarcely able to 'make both ends meet.' Prior to the National Assistance Act of 1948, if a parent became chargeable to the poor rate his children, if able, could be made to contribute to his or her support; now, however, the responsibility for the maintenance of parents in case of need is

upon the National Assistance Board, while the obligation to provide accommodation is upon the local authority.

If a daughter is seduced, her father, or mother, can bring an action for damages against the seducer, not directly for the seduction but for the loss of services consequent upon the daughter's becoming pregnant (if so) or sick. But it is essential for the parent to give some evidence, however slight, that the daughter did perform services for him (or her) of some kind. In regard to torts (actionable wrongs other than breach of contract) committed by children, e.g. libels, assaults, trespasses, negligence, the parent is liable only if he authorised the tortious act, or where it can be reasonably inferred that he must have known of and assented to its commission.

*Illegitimate.* As to the status of legitimacy and, inferentially, its converse, illegitimacy, *see* *LEGITIMACY; LEGITIMATION; BASTARD*. By the common law an illegitimate child is *filius nullius* (the son of no man), and therefore has no parent on whom he has any claim or from whom he can derive any rights; but under the Legitimacy Act, 1926, an illegitimate child is on the same footing as a legitimate child provided the parents are subsequently married to each other; but this statutory provision does not avail to legitimate a child whose father or mother was married to a third person at the time of the birth of the child. Even before this change, an illegitimate child was so far the legal child of his parents as to be able to take a bequest to a 'child or issue' if he had in his putative father's lifetime gained the reputation of being, in truth, the son (or daughter) of his father. It is the mother and not the putative father of an illegitimate child who has the care and right of custody of such child during nurture. The mother is bound so long as she remains unmarried or a widow to support her illegitimate children until they reach 16 years of age. If she marries the husband becomes bound in her stead, though if the wife has separate property and the husband cannot support his family the wife must do so. *See also* *ADOPTION; BASTARD; CHILDREN, NATIONAL SOCIETY; CHILDREN AND YOUNG PERSONS; GUARDIANS; INFANT; LEGITIMACY; LEGITIMATION; REGISTRATION OF BIRTHS, MARRIAGES, AND DEATHS*.

*See* W. P. Eversley, *Law of Domestic Relations*, 6th ed., 1951; Lushington, *Law of Affiliation and Bastardy*, 7th ed., 1951; Sir W. Clark Hall and A. O. L. Morrison, *Law Relating to Children and Young Persons*, 5th ed., 1956.

Parents' National Educational Union, founded by Charlotte Mason in 1888, non-profit-making society of world-wide membership, offering practical help to parents and others. Members receive a monthly copy of the *Parents' Review*, and a leaflet giving reading and occupations for children under 5, and may use the lending library, where advice on educational problems may be given. The Parents' Union School is available to the children of members. The school is

conducted by correspondence and plans a wide curriculum in all usual subjects for children aged 5-18 working in P.N.E.U. schools and families. The Charlotte Mason College, Ambleside, Westmorland, offers a 3-year training in the philosophy of Charlotte Mason, and her principles are carried out in the Practising School attached to the college, in which students have part of their training. Address: P.N.E.U., Murray House, Vandon Street, London, S.W.1.

**Parentucelli, Tommaso**, see **NICHOLAS** (popes), *Nicholas V.*

**Pares, Sir Bernard** (1867-1949), historian and student of Slavonic languages and literature, educated at Harrow and Trinity College, Cambridge. He first visited Russia in 1898, subsequently in 1906 and often in later years, acquiring a wide knowledge of Russian political and social life before the 1917 revolution. His views on Russian constitutional advance at this period are given in his *Russia and Reform*, 1907. Appointed reader in Russian hist. at Liverpool Univ. (1906), he was prof. of Russian hist., language, and literature there from 1908 to 1917. But in the meantime he spent much of his time in Russia and, in 1914, with the consent of the Tsarist Gov., was appointed a Brit. observer with the Russian forces, describing his experiences in *Day by Day with the Russian Army*, 1915. K.B.E. In 1919, he was appointed to a chair of Russian in London Univ. in the same year; he developed, and became the first director of, the School of Slavonic and E. European Studies there. In 1925 he pub. his *History of Russia*. His chief work is *The Fall of the Russian Monarchy*, 1939, based on a careful examination of documents, memoirs and interviews, and his previous experiences in Russia, and thought one of the best existing narratives, from the liberal standpoint, of the causes and earlier incidents of the October Revolution. During the Second World War he lectured and broadcast on Russia in America and Canada, and in 1944 pub. a 'Penguin' book on *Russia and the Peace*, which followed a 'Penguin Special' on *Russia*. Other works: *Letters of the Tsar and Tsarina* (ed. Eng. trans. 1924), and a trans. of Griboedov's comedy *Gore at Uma*, under the title of *The Misfortune of being Clever*, 1925; and *Moscow admits a Critic*, 1936.

**Paresis**, see **PARALYSIS**.

**Parhelia** and **Paraselenae**, see **MOCK SUNS** and **MOONS**.

**Pari**, in Persian folk-lore a class of supernatural beings of beneficent character. The Persian P.s are of both sexes, although the female is more popularly used in legend, of surpassing beauty and immortal. They were created after the Devs, with whom they are in perpetual warfare. Moore's *Lalla Rookh* tells how a P. obtained admission to paradise.

**Paria**, Gulf of, inlet of the Caribbean Sea, between the is. of Trinidad and the mainland of Venezuela.

**Pariah**, name given to the lowest class of the pop. of India, which, not belonging to any of the castes of the Brahminical

system, is shunned even by the lowest Hindu, as touching a P. would render him impure.

**Parian Chronicle**, see **ARUNDEL MARBLES**.

**Paris**, second son of Priam and Hecuba. When he was born he was exposed on Mt Ida, but was brought up by a shepherd, and received the name of Alexander, or defender of men and flocks. Later he was received by Priam and married Oenone, but deserted her for Helen. He was called upon by Zeus to decide as to which was the fairest, Hera, Athena, or Aphrodite. Hera offered him the sovereignty of Asia, Athena renown in war, and Aphrodite the fairest woman for his wife. He decided in favour of Aphrodite. She took him to Greece, where he was received by Menelaus in his palace at Sparta, but carried off Helen, his wife, the most beautiful woman in the world. From this arose the Trojan war. P. was defeated by Menelaus, but was carried off by Aphrodite. He killed Achilles, but was wounded, on the capture of Troy, by Philoctetes with one of the arrows of Hercules. He returned to his wife, Oenone, but she refused to heal him and he died. Oenone, remorseful, thereupon killed herself. P. is represented as a beautiful beardless youth with a Phrygian cap.

**Paris, Alexis Paulin** (1800-81), Fr. scholar, b. Avenay (Marne). He pub. in 1824 *Apologie de l'école romantique*. In 1828 he was appointed to the dept of MSS. in the Bibliothèque Royale. During 1830-6 he completed a Fr. trans. of Byron's works in 13 vols., and from 1836 to 1848 compiled a valuable catalogue of the *Manuscrits français de la bibliothèque du roi*, which has formed the basis of all subsequent works on early Fr. literature. P. was the first to occupy the chair of medieval literature founded at the Collège de France in 1853. On his retirement he was made an officer of the Legion of Honour.

**Paris, Gaston Bruno Paulin** (1839-1903), Fr. scholar, son of Alexis Paulin P., b. Avenay (Marne). He studied at Bonn, at Göttingen, and at the Ecole des Chartes. In 1865 he won his doctor's degree by a thesis on the *Histoire politique de Charlemagne*. He founded with P. Meyer, C. Morel, and H. Zotenberg, the *Revue critique* in 1866, and with P. Meyer in 1872 the *Romania*. His connection with these two journals was in great part the cause of the revival of philological study in France. Among P.'s works may be mentioned *De Pseudo-Turpino*, 1865, the *Vie de Saint-Alexis*, 1875, the *Petit Poulet et la grande oorse*, 1875, and the *Littérature française du moyen âge*, 1888, 1890. He succeeded his father as prof. of medieval Fr. literature at the Collège de France in 1872, of which he was appointed director in 1895.

**Paris, Louis Philippe Albert, Comte de** (1838-94), see **BOURBON**.

**Paris, Matthew** (c. 1200-59), historian and monk, entered the monastery of St Albans in 1217. He succeeded Roger of

Wendover as chronicler to the monastery (1236), and carried on the *Chronica Majora*, a hist. from the creation down to 1259, from the summer of 1235. He visited Norway in 1248, but returned to England in 1249. He is the outstanding Lat. chronicler of the 13th cent., his style being vigorous and bright, the material richly interlaced with the author's own foibles and prejudices; yet his writing is of great historic value, giving as it does information derived from leading actors in contemporary events. He also wrote *Historia Anglorum*, a summary of the chief events between 1200 and 1250. The standard ed. of the *Chronica Majora*, by Dr. Luard, was pub. in the Rolls Series, 1872-83.

Paris (anct Lutetia), cap. city of France and of the Fr. Union, and also of the dept of Seine (q.v.). It is named from the Parisii, a Celtic tribe. The city is built on both banks of the Seine (q.v.), about 110 m. from the riv. mouth, in 2 unequal parts, with the Ile de la Cité at the centre. On the r. b. it is enclosed by a sweep of low hills known as the Collines de P. On the l. b. are the Butte aux Calles, Montsouris, Montrouge, and Mont Ste Geneviève. The rising ground in the suburbs was once the site of forts. The area at present occupied by the Place de la Bastille and the *Hôtel de ville*, known as the Marais, was, for a long time, under water. Of numerous islets there now remain only the Ile de la Cité, the Ile aux Vaches, now called St Louis, and the Ile de la Conférence, on which is built the Auteuil viaduct. The height of the city above sea level varies from 85 ft to 410 ft, the highest point being the hill of Montmartre (q.v.). Geographically P. occupies an important position, being situated in a fertile plain, on ground of recent alluvial formation, near the confluence of the Oise, the Marne, and the Yonne with the Seine, and (a factor of equal importance in early days) just at the point where the natural highway from the Mediterranean to the ocean is joined by the route from Aquitaine and Spain. The climate is temperate: the highest recorded temps. were 38° C. in 1874 and 1949; the lowest was -21° C. in 1929. P. has a built-up area of about 31 sq. m. Its pop. is 2,850,200, the density of pop. being the greatest in Europe.

**Administration.** The municipal gov. is under the prefect of the Seine dept and a municipal council, which is elected and which in turn elects a president. The *maires* of the 20 arrons. into which P. is divided, who assist the prefect in certain services, are, however, civil servants, appointed by the minister of the interior. There is a justice of the peace for each arron. The police are under a separate functionary, the prefect of police; both he and the prefect of the dept are appointed by the gov. The *juges de la paix* hold their courts at their respective *mairies*. A tribunal of police sits at the Palais de Justice. The Cour de Cassation, which sits cases before their actual trial, and the Tribunal de Commerce, also sit at the Palais de Justice. P. is also the seat of

the courts of first instance and appeal. It is the seat of the president of the rep., who resides at the Palais de l'Elysée. The National Assembly is housed at the Palais Bourbon, and the Council of the Rep. at the Palais de Luxembourg.

P. is the seat of an archbishopric, whose titular, normally a cardinal, is primate of the Ile de France. He has under his jurisdiction 94 par. churches, the Institut Catholique, 19 eccles. communities, 54 religious houses, and 1 seminary. There are more than 100 religious buildings of various other denominations and nationalities. P. has 38 hospitals, besides a number of foreign charitable institutions and private clinics. The cemeteries include that of Père Lachaise (q.v.), where the marshals of France are buried, as well as such famous writers as Balzac, de Musset, and Oscar Wilde. There are a number of prisons, but the famous one of St Lazare has been demolished.

Five official academies form the Institut. Their H.Q. are at the Hôtel Quai Conti, formerly the Collège des Quatre-Nations. The most famous is the Académie Française, founded by Richelieu in 1635. The others are the Académie des Inscriptions et Belles Lettres, the Académie des Sciences, the Académie des Beaux Arts, and the Académie des Sciences Morales. The Académie de Médecine is at the Faculté de Médecine at the Sorbonne (q.v.), the name by which the famous univ. of P. is often known. There are 2 municipal colleges and more than 2000 primary schools, besides a number of private educational establs. Twenty-one national museums are controlled by the Ministry of Education, 2 by the Institut, and 7 by various private bodies. The most important is the Musée de Louvre, one of the finest in the world, and the Musée Carnavalet, which specialises in the hist. of P. Among the 155 libraries and archives of P. the most important is the Bibliothèque Nationale (q.v.). The Bibliothèque de l'Arsenal houses the Rondel Collection, dealing especially with the theatre, and the Bibliothèque Mazarine possesses a collection of 900 incunabula. There are numerous places of amusement. The national theatres include the Opéra National and the Opéra Comique; the Comédie-Française and the Théâtre Populaire.

There are 6 railway termini in P., including the Gare du Nord, Gare de Lyon, and Gare St Lazare. For internal traffic there is the Métropolitain, and an extensive motor-bus service. There are airports at Le Bourget and Orly. The prin. markets are at the Halles Centrales. The dist. around P. supplies it with much of its food, and P. manufs. jam, automobiles, beer, boots and shoes, and refines sugar. There are also luxury manufs. such as jewellery, dresses, furs, clocks, engravings, dress trimmings and ornaments, embroidery, tapestry, porcelain, etc.

**History.** The Ile de la Cité, largest of the Seine is., was the nucleus of modern P. Before the Rom. conquest of the country, a small tribe of Gauls, known as the



Paris, settled there. The Romans called the is. Lutetia, and built a camp there, and in 52 bc the country came under Rom. rule. The settlement began to spread on to the l. b. of the Seine and Caesar placed the tn and the region under the command of Labienus. A city was erected on this bank, large enough to contain massive arenas (excavated in 1856), but by the end of the 3rd cent. barbarian invasions forced the inhab. back to the is. St Denis and his companions, Rusticus

P. his cap. in 508, frequently residing there. After his conversion to Christianity he built the basilica of SS. Peter and Paul. Chilpine removed his cap. from P. in 567, and for the remainder of Merovingian rule P.'s hist. is sombre, except for the brilliant reign of Dagobert the Great (628-38). Charlemagne (768-814) succeeded the Merovingians. P. had only grown slowly under the Frankish kings, though the civil power of the church had greatly increased, and trade and



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NOTRE DAME

and Eleutherius, were the first to introduce Christianity, towards the end of the 3rd cent., having been sent by the Pope, and St Martin continued their work in the 4th cent. P. was the cap. of Constantius Chlorus, who had a palace there. In 410 P. joined the Armorican league. Attila attempted to enter P. in 451, but is said to have halted at the prayer of St Geneviève, who became patron saint of the city. This incident is commemorated by Landowski's statue of the saint on the Pont de la Tournelle and is illustrated in one of the frescoes in the Panthéon. In the Frankish invasion P. was captured by the Merovingian King Clovis (481-511), who made

the guilds were flourishing. Charlemagne made P. a co., and it became a duchy under Charles the Bald. In 845 the Norsemen reached P. by the Seine and laid waste the city, sacking its monasteries and churches. The city stood a 54-month siege against them in 885, led by Bishop Gozlin and Count Eudes. In 892 the Norsemen were routed by Eudes, and they never again captured P. Under the Capetians, the line that was to reign until the revolution, commencing with Hugh Capet in 987, P. became the permanent cap. of France. Their palace was in the Cité, where the Palais de Justice now stands, the towers of the Conciergerie being remains of it. Louis the Fat marked

out the second line of walls; these included the *faubourgs* of the l. b. In the reign of Henry I (1031-60) the church of St Martin des Champs, burned by the Norsemen, was rebuilt. The reign of Louis VI (1108-37) was marked by a great expansion of P., and the great abbey of St Victor and a nunnery at Montmartre were among the buildings erected. Between 1180 and 1213 Philip Augustus began the paving of P. and the building of its third wall. The wall was 8 ft thick, pierced by 24 gates, and fortified by about 500 towers. A part remains to-day. Besides this he built the Louvre (q.v.), a moated château, parts of 2 wings of which are incorporated in the present palace, and the remainder may be traced. The Louvre was originally a hunting lodge before the name came to signify any royal residence. Two great warehouses at the old market at Champignons, the origin of Les Halles, were also the work of Philip Augustus. It was in this reign, too (in 1182), that the choir of the cathedral of Notre Dame was completed, the first stone having been laid by Pope Alexander III 20 years earlier. The whole building, however, was not finished until the end of the 13th cent.

P. had by this time become the intellectual centre of Europe. In the first half of the 13th cent. the various schools organised themselves, thus giving to the univ. its definite character. P. Univ. was soon made famous by Peter Lombard, Abélard, and Sorbon, who gave his name to the Sorbonne. Louis IX, the Saint (1226-70), built the beautiful Sainte Chapelle (q.v.), famous for the magnificence of its structure and its stained glass. He founded many monasteries and abbeys, as well as the Hôtel Dieu. Philip the Fair estab. the Parlement, the chief legal tribunal of the kingdom, which he housed in his palace of the Cité. In 1302 the Third Estate met with the States-General for the first time, to discuss the question of the temporal supremacy of the Pope. In the reign of Philip VI, who succeeded to the throne in 1328, and in the succeeding reigns, France became the scene of Eng. invasions. In 1346 the *faubourgs* were laid waste. Some order was restored at the accession of Charles V (1364), a great builder and art patron; the fourth wall around P. was built, which included the first buildings on the r. b. As the Louvre was no longer part of the defences of P., he transformed it into a sumptuous palace; he also founded the first royal library. To him are also due the beautiful chapel of Vincennes and the raising of the Bastille (q.v.). The minority and reign of Charles VI (1380-1422) was a period of deep misery for P. The rivalry of the Armagnacs and Burgundians divided P. into 2 factions, and the Eng. occupied it, being driven out in 1446. P. then enjoyed a period of calm. During the reign of Charles VIII the Petit Pont and the Pont Notre Dame were rebuilt; the latter replaced the previous wooden bridge in 1499, the houses on the new bridge being the first in P. to be numbered. Francis I in 1528 began the building of

the Louvre des Valois, and founded the Collège de France. Religious wars broke out in France, culminating in the massacre of St Bartholomew's Eve (q.v.) in Aug. 1572 when the Huguenots in P. were murdered by the Rom. Catholics. Only after Henry IV's conversion to Rom. Catholicism in 1593 was peace restored, P. having suffered 2 sieges during the course of the wars. Catherine de' Medici had had erected the Petite Galerie on the S. of the Louvre, and had begun in 1564 the palace of the Tuileries (q.v.). Henry elaborated a vast scheme for finishing the Tuileries, quadrupling the size of the Louvre, and joining the 2 palaces by continuing the Grande Galerie to the W. He practically completed the *Hôtel de ville*, built the N. portion of the Pont Neuf, and incorporated the 2 islets W. of the Cité with the is. Under Louis XIII building began on the Île St Louis. The palace of Luxembourg, built by Marie de' Medici, was begun in 1615. Richelieu commissioned Lemercur in 1624 to complete Henry IV's scheme for the enlargement of the Louvre. Lemercur also designed the Hôtel Richelieu, which was later extended by Anne of Austria and renamed the Palais Royal. In 1614 Louis XIII laid the first stone of the first bridge from the Île St Louis, to the N. bank. P. again suffered internal dissension, culminating in the wars of the Fronde (1648-52) against Mazarin; but order was eventually restored to the advantage of the royal power. During Louis XIV's minority the building now known as the Institut de France was built as the Collège des Quatre-Nations, and also the Hôtel Mazarin, now the Bibliothèque Nationale. Louis XIV was responsible for many magnificent buildings. During his long reign much of medieval P. was demolished. He finished the N. wing and riv. front of the Louvre. Other buildings completed during his reign were the 2 domed churches of St Louis des Invalides and the Val de Grâce. The Porte St Martin and the Porte St Denis were transformed into triumphal arches. During this reign the court resided at Versailles and the pop. of P. insensibly lost their loyalty to the person of the king. In Louis XV's reign huge buildings arose: the Place Louis XV (now Place de la Concorde) and the church which was later secularised as the Panthéon. But for 30 years of Louis XV's reign nothing was done towards the completion of the Louvre, nor was there really much progress in P. during his or his successor's reign. Louis XVI began the fifth circuit enclosing P. (1788). The revolution started in 1789 with the storming of the Bastille and its destruction. The prin. events of the revolution took place in P., Louis XVI being guillotined there in 1793. Thousands of executions followed, but P. regained a degree of calm under the Directory and the Consulate, and the period of neglect and destruction came to an end. In 1795 Bonaparte opened fire from the steps of the church of St Roch on the royalists who were marching against the Convention. He soon rose to power,

and became emperor of the French in 1804, being crowned at Notre Dame in the presence of Pius VII. Napoleon commenced the modernisation of P. Perreault's colonnade to the Louvre was restored, the 4 façades of the quadrangle completed, and the Pont des Arts built. The 2 triumphal arches in the Place de Carrousel and the Place de l'Étoile were erected by Napoleon, though the latter, the Arc de Triomphe, was not completed until the reign of Louis Philippe. It is notable for its magnificent group sculpture by Rude, 'La Marseillaise.' The quays on the S. bank of the Seine were also built under Napoleon, and he ordered the church of the Madeleine, begun in 1764, to be completed as a Temple of Glory; it was not, however, finished till 1842, when it became a Catholic church. He drove 60 new streets through the city. In 1815 Napoleon was finally defeated. The sixth circuit was begun in 1818. There was a 3-day revolution in P. in 1830, when Charles X was deposed. This was commemorated by the bronze Colonne de Juillet in the Place de la Bataille. Louis Philippe's reign also ended in revolution, which led to the estab. of a rep. Between 1815 and 1848 the basilicas of Notre Dame de Lorette and St Vincent Paul were erected as well as many bridges, and 55 new streets were laid. The columns on the Place de la Concorde and the Place de la Baille were raised, but the greatest architectural event of the period was the careful restoration, by Viollet le Duc (q.v.) of Notre Dame (q.v.) and the Sainte Chapelle. In 1852 Louis Napoleon was proclaimed emperor. The seventh circuit, known as that of Thiers, was begun in 1841 and finished in 1869. In 1857 the N. façade of the Louvre was completed. The great changes which have made the modern P. were effected during the Second Empire under Baron Haussmann (q.v.), prefect of the Seine from 1853. All remnants of medieval P. were swept away. Over £34,000,000 were spent then on making 22 new boulevards and avenues. Haussmann's idea was to raise the height of P. instead of allowing it to continue to spread outwards. P. was besieged by the Germans during the Franco-Prussian war from Sept. 1870 to Jan. 1871, and the city suffered bombardment, damage, and famine. After the peace a civil war known as the Commune (q.v.) was waged in P., in which the *Hôtel de ville* and the Tuilleries were destroyed. The Eiffel Tower (q.v.) was constructed for the exhibition of 1889; that of 1900 marked the extension of P. into the plain of Grenelle. Under the Third Rep. the new *Hôtel de ville*, the new Sorbonne, the Trocadéro, the Opéra, and the church of the Sacré Cœur were built. In 1937 the Palais de Chaillot replaced the old Trocadéro. During the First World War P. suffered air-raids and was threatened with attack in Aug. 1914. A military governor was appointed and the seat of gov. removed to Bordeaux the following month. The battle of the Marne (q.v.)

drove the Germans away from the cap. Reinforcements were sent to the battlefield from P. in taxicabs. The gov. returned to P. in Dec. 1914. From 1916 to 1918 P. was attacked by 'Big Bertha.' In July 1919 an allied victory march through P. celebrated the signing of the treaty of Versailles, and on 11 Nov. 1920 the body of an unknown soldier was buried under the Arc de Triomphe. Between the 2 world wars some blocks of luxury flats in the W. of P., and some 30 new churches, products of the Catholic revival of the 1930's, were the prin. new buildings, apart from those already mentioned. Overcrowding has, however, been one of the social and economic effects of the wars.

In June 1940 Ger. troops occupied P., the French having withdrawn to spare it from devastation. In May 1941 a Ger. municipal councillor was appointed commissioner for P. Allied planes made numerous raids on the factory suburbs of P., notably a heavy night attack by R.A.F. bombers on the Renault works at Billancourt in Mar. 1942. In Aug. 1944 Gen. von Choltitz surrendered P. to Gen. Leclerc, after some bitter fighting had occurred between Fr. partisans and Ger. troops (see WESTERN FRONT IN SECOND WORLD WAR). P. had suffered little damage during the war, but nevertheless was faced in 1945 with a severe housing problem, since there had been no building done since 1939. New buildings were commenced both in the centre of P. and in its suburbs, and a number of Métropolitain stations were named after war personalities or incidents, e.g. Franklin D. Roosevelt.

*Present-day Paris.* The whole of P. was once surrounded by fortifications comprising 3 distinct lines of defence: the inner ramparts were demolished between the world wars. Beyond these there are separate rings of detached forts in the surrounding heights, the outer ring extending for about 75 m. and at about 8 m. from the ramparts, the intermediary forts varying in distance from the outer from 2 to 5 m. The inner line of fortifications confines P. to something roughly resembling a pear in shape, with the stalk towards the W., and the Cité and the Île de St Louis (on the bend of 7 m. which the Seine makes in its 5-hour flow through the city) for core. The riv. flows between broad stone embankments, being spanned by 32 bridges in its course. The greater part of the Cité is occupied by 5 buildings: Notre Dame, the Palais de Justice, to which a new wing was added in 1911-1914, the Sainte Chapelle, the Préfecture de Police, and the Tribunal de Commerce. The Île de St Louis is known now as one of the most peaceful quarters of P. These is., and across the riv. on either hand the busiest part of P. are found within the circuit of the boulevards, the broad, tree-planted thoroughfares which have replaced the ramparts of Louis XIII on the N. and of Philip Augustus on the S. Within this boundary, and on the N. or r. b. of the riv., the following are among the chief points of interest:

the Louvre; to the W. between its N. and S. wings is the Place de Carrousel, with the Arc de Triomphe, and stretching W. again the Jardin des Tuilleries and the Place de la Concorde. Outside the circuit of the boulevards is the Avenue des Champs-Élysées; between the Louvre and the gardens is the site of the Tuilleries. In a straight line with the Champs-Élysées is the Arc de Triomphe in the Place de l'Étoile, from which sev. avenues radiate. S. of this line, still on the r. b. of the riv., is one of the most fashionable residential areas. To the N. of

slums. N. P.'s suburbs are mainly industrial, particularly in the NE. On the S. bank of the Seine and within the space formerly enclosed within the walls of Louis Philippe is the Quartier Latin in which are to be found the various buildings of the univ. of P., the Institut, the Musée Cluny, the Panthéon, and the churches of St Severin and St Étienne du Mont. Between the 2 world wars a new univ. residential quarter was erected beyond the Porte D'Orléans, known as the Cité Universitaire, with different buildings to house the students of different national-



Photo Unesco Riboud

THE PARIS HEADQUARTERS OF UNESCO, AS SEEN FROM THE EIFFEL TOWER

the Jardin des Tuilleries are the Ministry of Marine, the Ministry of Justice, and the Vendôme Column; to the N. of the Louvre the Palais Royal, the Bibliothèque Nationale, and the Bourse. E. of the Louvre are the Halles Centrales, in Tour St Jacques, the *Hôtel de ville*, the site of the Bastille, and the Bibliothèque de l'Arsenal. N. is the Hôtel de Rohan, the Hôtel Carnavale, and the Musée Victor Hugo. In the dist. N. of the Seine and beyond the portion already described the prin. points of interest include the following: just beyond the boulevards the Madeleine and the New Opera House. Further N. is the 'artists' quarter' of Montmartre. About 1 m. beyond the boulevards to the E. is the cemetery of Père Lachaise, and in the N. suburbs the abbey of St Denis (q.v.) containing the royal tombs. In St Denis and Aubervilliers are the cap.'s worst

ities: Collège France-Britannique, Collège au Japon, etc. Beyond the old Quartier Latin to the W. are the Ecole Militaire and the Champ de Mars, with the Eiffel Tower facing the Palais de Chaillot on the opposite bank of the riv. A little to the E. of these is the Hôtel des Invalides, and on the riv. bank close to the boundary the Ecole des Beaux Arts; and S. of that the Palais du Luxembourg with its beautiful gardens, and to the E. on the riv. bank the Jardin des Plantes. Just outside the old ramparts are the Bois de Boulogne on the W. and the Bois de Vincennes on the SE.

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**Paris:** 1. City of Texas, U.S.A., the co. seat of Lamar co., 93 m. NE. of Dallas. It has cotton-seed oil mills, and a cotton-oil refinery. Pop. 18,700.

2. Tn and port of entry of Brant co., Ontario, Canada, 30 m. W. of Hamilton. It has potteries, knitting mills, and oil refineries. Pop. 5404.

**Paris:** 1. Famous pantomime of Nero's reign. He was a great favourite of the emperor, who declared him to be freeborn though originally a slave of Octavia; but when Nero attempted to become a pantomime he caused P. to be put to death, deeming him a dangerous rival. See Tacitus, *Annals*, xlii.

2. Famous pantomime of Domitian's reign, was a native of Egypt. He was a great favourite both with the emperor and the people, but was put to death for intriguing with the emperor's wife.

**Paris**, genus of herbaceous perennials (family Liliaceae), with a stout rhizome and erect stem, bearing 4 whorled net-veined leaves, and a solitary green flower followed by a berry-like fruit. The only Brit. species is the herb P., or truelove knot (*P. quadrifolia*), a rather uncommon plant found in woods. The berry is black. *P. polyphylla*, Himalayan, bears yellowish-green flowers, succeeded by bright red berries, and is grown in gardens. Its perianth is normally in 8 reflexed parts, 4 large and lanceolate, and the alternating 4 small and narrow.

**Paris**, Declaration of, see DECLARATION OF PARIS.

**Paris**, Lyons, and Mediterranean Railway, see SOCIÉTÉ NATIONALE DES CHEMINS DE FER FRANÇAIS.

**Paris**, Treaties of, name given to various international peace treaties signed in P.; viz. the treaty signed 10 Feb. 1763, by Britain, France, and Spain at the end of the Seven Years War; the treaty signed on 3 Sept., 1783, between Britain and the Amer. commissioners, recognising Amer. independence; the treaty of 30 May, 1814, between the Allies and France after the abdication of Napoleon; the treaty concluded on 20 Nov. 1815 between the same signatories after the final overthrow of Napoleon; and the treaty of 30 March, 1856, signed by Great Britain, France, Turkey, Sardinia, and Russia at the close of the Crimean war. The peace conference after the First World War, which drew up the Versailles peace treaty, was held in P. in 1919-20; and the peace conference held in P. after the Second World War in 1946 drew up the peace treaties between the Allies and Italy, Hungary, Bulgaria, Rumania, and Finland.

**Paris Métro.** The Paris Métropolitan (Métro) is the underground railway system operated by the Paris Transport Authority. The first section was opened in 1900, and a very complete network has

been built up. About 120 m. are open to traffic. One short section is being experimentally operated by a rubber-tyred train running on a concrete track. This is the first of its kind in the world. The Métro has been the model for several other similar systems in large cities, e.g. Madrid.

**Paris University**, see SORBONNE.

**Parish.** The term par., as used to-day in connection with local gov., means no more, according to the Interpretation Act, 1889, as amended by the Rating and Valuation Act, 1925, than a place for which separate overseers were or could be appointed or a separate Poor Rate levied; but like all statutory definitions, that of par. is one of convenience only and not instruction. Originally the expression par. was properly of eccles. significance only; and though it has been suggested that the explanation of the origin of urb. pars. is involved in great obscurity, Blackstone's definition that a par. meant primarily 'that circuit of ground in which the souls under the care of one parson or vicar do inhabit' is probably as true of urb. as of rural pars. The difficulties arise from the fact that from quite early times the par. was regarded as being not only an eccles. but also a civil subdivision of the co., and that the legislature has generally dealt with the par. as the unit area not only for Poor Law purposes but for local administrative purposes generally. In parts of England the par. for local gov. purposes remains practically coterminous with the old eccles. bounds; but in a great number of urb. dists., and especially the metropolis, many pars. have been grouped into one, or the term has been used to cover other areas which, though not historically pars., have a not dissimilar organisation. The result is that in many cases a particular area may be a par. for civil but not for eccles. purposes, while in other cases a particular area may be a par. for some civil purposes and not for others. Historically a par. denotes a circumscribed ter. varying in extent and pop., but annexed to a single church whose incumbent (q.v.) is entitled to the tithes (or other commuted payment) within that ter. The creation of pars. in England was gradual and not complete till shortly before the Conquest. Most historians concur in the theory that the Eng. parochial divs. arose chiefly from lay foundations, the differences in extent being accounted for by the varying limits appointed for them at their origin. The origin of these lay foundations is to be sought in the early inadequacy of the means of divine worship supplied by the bishoprics and monasteries, when the feudal lords began to build their own demesne churches and oratories for their families and tenants. The bishops consecrated these places and consented to the incumbent residing at the church and receiving the tithes and offerings of the inhab. to whose use the particular church was limited, as well as any endowment which the founder happened to annex to it. The last concession made to the lay-founder was probably the advowson (q.v.).

For civil purposes the par. has ceased to be a unit of administration in urb. areas. In rural dists. the dist. is still divided into rural pars. for which there is a par. meeting and, in the more populous pars., a representative par. council also. See LOCAL GOVERNMENT.

Parish Clerk, see CLERK.

Parish Councils, see LOCAL GOVERNMENT.

Parke, Mungo (1771-1806), explorer, b. Selkirk; he went to Edinburgh Univ., where he studied medicine and surgery, and distinguished himself as a botanist. In 1792 he went to Sumatra and there carried out certain botanical investigations, the result of which brought him into notice. In 1795 the African Association sent him to explore the course of the Niger, and this he did accompanied only by 2 servants. The journey was full of difficulties and set-backs. At one point he was imprisoned for 4 months by a hostile chief, and escaped with only his horse, and his pocket compass. At last, in July 1796, he found the long-sought Niger, and followed the riv. down-stream from Segou. But he was weak, hungry, and without means, and he had to turn back, finally collapsing with fever at Bamako after having traced the course of the riv. for 300 m. Only the nursing of an African, in whose house he remained for 7 months, saved his life. On his return in 1799 he pub. his *Travels* (see Everyman's Library), which achieved great popularity. He now estab. himself as a surgeon at Peebles, but the love of travel was too strong within him for such a life, and in 1805 he sailed for the Niger. This expedition was a much more ambitious one than the first and consisted of some 70 Europeans, including soldiers, artificers, draughtsmen, as well as native guides and carriers. They started, as before, from Pisanis, in the Gambia, but by the time they had reached the Niger only 11 Europeans were left alive; the rest had succumbed to fever and dysentery. P., however, was undeterred and determined to continue from where he had left off on his first expedition. With the help of the one soldier still capable of work, he built, out of 2 canoes, a serviceable boat which he called the *Joliba*, the native name for the Niger. Before setting sail in it with the poor remnants of his party he gave letters to a native guide to take back to the Gambia for transmission to England. One of these, addressed to the Colonial Office, ends on a note of high courage, to the effect that though all with him should die he would still persevere and if he could not succeed in the object of his journey he would at least die on the Niger. P. perished in the rapids at Bussa; but not before he and his companions had navigated a thousand m. of the riv. The *Joliba* seems to have got into a wrong channel, struck a rock, and remained fast. Hostile tribesmen on the bank attacked with spears and arrows, and, either because they were unable to defend themselves, or because the boat was smashed under them, the occupants were swept into the water

and drowned. Today at Pisanis there stands a monument commemorating this gallant Scotsman. See life by L. G. Gibbon, 1934.

Park, large enclosed piece of ground, usually with woodland and pasture, attached to a country house, or an enclosure in a town ornamentally laid out for public recreation. In England a bor. or urb. council has the power to purchase land for such a purpose, and there are few towns that have not one or more public P.s. Those presented by private individuals are usually maintained by the bor. or urb. council. The word is also used for a large tract of land kept in its natural state for the public benefit. Among the most famous P.s. public or natural, may be mentioned Hyde P. and Regent's P. (q.v.) in London, the Bois de Boulogne (q.v.) in Paris, the Tiergarten in Berlin, the Yellowstone National P. (q.v.) in the state of Wyoming, U.S.A., the Algonquin P. in Ontario, the Yosemite (q.v.) National P. in Central California, the Australian National P. at Port Hacking, the Rocky Mts (q.v.) and Jasper (q.v.) P.s. in Alberta, and the Parc National Albert in the Belgian Congo, in which is Mt Karisimbi (14,780 ft high). But the great national P.s. have nothing in common with a small Brit. public P., and may be more appropriately compared with the animal sanctuary at Whipsnade (q.v.). P.s. like the Kruger National P. in S. Africa and the Buffalo and Wood Buffalo P.s. in Alberta are essentially game reserves; and in the Brit. and Belgian E. and central African dependencies there are many P.s. for the preservation of the fauna and flora of Africa. See also GAME RESERVES; NATIONAL PARKS; OPEN SPACES AND COMMONS.

Park Ridge, residential city in Illinois, U.S.A., a NW. suburb of Chicago. Truck farming is carried on. The O'Hare Field, Chicago international airport, is near by. Pop. 16,602.

Parker, Dorothy Rothschild (1893- ), Amer. satirist and humorist, b. West End, New Jersey. Educ. at the Convent of the Blessed Sacrament, New York, she became a journalist, and was for a time book-reviewer on the *New Yorker*. Though satirical, she could command pathos, as in her short story 'Big Blonde,' which won the O. Henry Prize in 1929. Her books of verse include *Enough Rope*, 1927, *Sunset Gun*, 1928, *Death and Taxes*, 1931, and *Not so Deep as a Well*, 1936. *Laments for the Living*, 1930, and *Here Lies*, 1939, are vols. of short stories. She was married first to Edwin P. Parker and then to Alan Campbell, a film actor.

Parker, Sir Gilbert (1862-1932), politician and writer, b. Camden E., near Addington, Ontario, Canada, and educated at Toronto. He was Conservative M.P. for Gravesend 1900-18, and was made a baronet in 1915. He wrote poems, books of travel, and novels. Probably the most popular of his novels are *The Seats of the Mighty*, 1896, which was dramatised; *The Lane that had no Turning*, 1900; and *A Ladder of Swords*, 1904. His autobiography, *Tarboe*, appeared in 1927.

**Parker, Horatio** (1863-1919), Amer. organist and composer, b. Auburndale, Massachusetts. He studied at Boston and at Munich, where he was a pupil of Rheinberger. In 1884 he returned to New York and became an organist and choirmaster, and taught at the National Conservatory directed by Dvořák. Later he became organist at Trinity Church, Boston, and in 1894 prof. of music at Yale Univ. He visited England sev. times for performances of his works at the festivals (*Hora Novissima*, at Chester and Worcester; and *A Wanderer's Psalm*, at Hereford), and to receive the Mus.D.

sent to the Baltic against the fleets of Russia, Sweden, and Denmark. It will be remembered that it was his signal that Nelson ignored at the battle of Copenhagen by jocularly using his blind eye to look at the signals (see NELSON). P. later compelled Sweden to remain neutral, and was ready to sail to Kronstadt when the Tsar's death put an end to the hostilities.

**Parker, Joseph** (1830-1902), Congregational minister, son of a stonemason at Hexham-on-Tyne. About 1845 he became known as a local preacher and temperance lecturer. On entering the



CHATSWORTH PARK, DERBYSHIRE

Chatsworth House, a seat of the Duke of Devonshire, was built by Sir William Cavendish in 1557, and rebuilt by the first duke between 1687 and 1707.

from Cambridge in 1902. Among his works are (opera) *Mona and Fairyland*; (oratorios) *The Legend of Saint Christopher* and *The Dream of Mary*.

**Parker, Sir Hyde** (1714-c. 1783), adm., b. Tredington, Worcestershire. He commanded the Brit. fleet in the action off the Dogger Bank in 1781, in which 3 Dutch ships were destroyed and the rest compelled to retreat to harbour. Having been given command of the E. India fleet, P. sailed from Rio de Janeiro 12 Dec. 1782; but neither he nor his ship was again heard of. Nine years later its equipment was found and it was presumed to have been lost with all hands.

**Parker, Sir Hyde** (1739-1807), second son of above and a more famous adm. He distinguished himself in the Amer. war, blockaded the Dutch harbours in 1782, and commanded the fleet in the E. Indies in 1795. In 1801 he was in supreme command of the fleet which was

ministry in 1852, he became assistant to John Campbell at Whitefield's Tabernacle, London, soon afterwards going as pastor to Banbury, whence he went to Manchester. P. returned to London in 1869 as pastor of the Poultry church, and almost immediately began his great scheme for the erection of the building on Holborn Viaduct known as the City Temple, which was opened in May 1874. There he preached to large congregations and became famous among nonconformists for his powerful oratory. He wrote many books on religious subjects. See his *My Life and Teaching*, 1889, and *A Preacher's Life*, 1899.

**Parker, Louis Napoleon** (1852-1944), Brit. dramatist, composer, and pageant master, b. Calvados, France, his father being an Amer. lawyer and his mother Eng. His great-grandfather, the Honourable Isaac P., was from 1814 to 1830 chief justice of Massachusetts. P. made rapid

progress in the study of music and, at the instance of Sir Wm Stenrøde Bennett, went to Sherborne school as piano master, and stayed in Sherborne for 20 years, teaching languages as well as music. P. later went to London to teach music, but instead became a playwright, improvising his own theatre from a large barn. The list of his works is long and, generally, his plays were more successful in America than in Britain. At one time 3 New York theatres were crowded by *Joseph, Diraelt*, and *The Paper Chase*, while *Pomander Walk* had a record run on tour in the States. It was in *Drake*, however, produced at His Majesty's Theatre in 1912, and revived in 1914, that P. reached his highest level in spectacular grouping on the stage. Already he had achieved a great reputation outside by his pageants at Sherborne, Warwick, Bury St Edmunds, and elsewhere, of which he tells in his reminiscences, *Several of My Lives*, 1928. Besides writing his own plays he was a skilful adapter of the work of others. His *David Copperfield* gave Sir Herbert Tree a great opportunity. His *Beauty and the Barge* was very successful, and *The Man in the Street* and *The Bugle Call* were effective curtain raisers. Of his later work mention may be made of *The Cardinal*, performed at St George's Theatre during Canterbury Week of 1930, and *The Lily of France*, a play on Joan of Arc produced at Nancy in 1936.



MATTHEW PARKER

Parker, Matthew (1504-75), archbishop of Canterbury, b. Norwich. In 1544 he was elected master of Corpus Christi College, Cambridge, and in 1545 vice-chancellor of the univ., in which capacity he manfully opposed the spoliation with which the colleges generally were threatened. In 1552 he was installed dean of Lincoln, but lived in retirement during Mary's reign, to be promoted on the accession of Elizabeth to the archbishopric of Canterbury. He sought to establish in

England a *via media* between Rom. Catholicism and Puritanism. He pub. *The Bishop's Bible*, 1603-8; *De antiquitate ecclesiae*, 1572; and eds. of Gildas, Asser, Aelfric, the *Flora historiarum*, Matthew Paris, and other important chroniclers. He presented a valuable collection of books and MSS. to Corpus Christi. See W. T. Hook, *Lives of the Archbishops of Canterbury*, 1872; A. S. Barnes, *Bishop Parker and the Anglican Orders*, 1922; and J. C. Whitebrook, *The Consecration of Matthew Parker*, 1935.

Parker, Sir Peter (1721-1811), admiral, b. Ireland, the son of Rear-Adm. Christopher P. (d. 1768). He served in the Mediterranean in 1743, and in 1775 was in command of a squadron which attacked Charlestown, being repulsed with the loss of 3 frigates. He took part in the reduction of Long Is. and Rhode Is. the same year; and in 1777, having been promoted to rear-adm., was appointed commander-in-chief at Jamaica. In 1782 he was created a baronet, and in 1789 promoted to be adm. of the fleet. He was the early patron of Nelson.

Parker, Theodore (1810-60), Amer. clergyman, b. Lexington, Massachusetts. Educ. at Harvard College, he settled as Unitarian minister at W. Roxbury in 1837. The rationalistic views which separated him from the more conservative portion of the Unitarians first attracted wide notice in consequence of an ordination sermon, in 1841, on 'The Transient and Permanent in Christianity.' He further developed his theological views in 5 lectures, delivered in Boston, and pub. (1841) under the title *A Discourse of Matters Pertaining to Religion*, which was followed by *Sermons of Theism, Atheism, and Popular Theology*, 1853.

Parker, Sir William (1781-1866), adm., the grandson of Sir Thomas P. (c. 1695-1784). He entered the navy in 1793, and served in the Channel fleet under Lord Howe, subsequently coming under Sir Hyde P. (1739-1807). He protected Brit. interests on the Tagus during the civil war of 1834. In 1841 he was appointed commander-in-chief in China, and, having captured Amoy, Ningpo, Woosung, and Shanghai, brought the war to a successful conclusion by seizing Chinkiang-foo. He rose to the rank of adm. in 1863.

Parkersburg, city of W. Virginia, U.S.A., on the Ohio R. 90 m. S. of Wheeling. It is centre of an oil, natural gas, coal, and clay region, and a shipping and distribution centre. Manufs. include rayon, steel, glassware, and porcelain. Pop. 29,700.

Parkes, Edmund Alexander (1819-76), prof. of hygiene, b. Bloxham, Oxfordshire. He studied at Univ. College, London. During 1842-45 he was assistant-surgeon in the Indian Army, and in 1840 was made prof. of clinical medicine at Univ. College. In 1855 he superintended a large civil hospital in the Dardanelles, opened to relieve the pressure upon the hospitals at Scutari during the Crimean war, and in 1860 accepted the chair of hygiene at the Army Medical



School. He was a pioneer of modern hygiene, and famous throughout Europe in the field of military hygiene. His most important work was his *Manual of Practical Hygiene* (8th ed., 1891), which has been trans. into many European languages.

**Parkes, Sir Harry Smith** (1828-85), diplomat, b. Birchall Hall, Bloxwich, Staffordshire. P. entered King Edward's Grammar School, but in 1841 went out to join his sisters, who had been settled some time in China. On his arrival at Macao he applied himself to the study of Chinese, which laid the foundation of his successful career. He was attaché in 1842 to Sir Henry Pottinger's punitive expedition up the Yangtze River, and, though only 15, P.'s knowledge of the language made him of immense service to the commissariat. In Sept. 1843 he entered the Brit. Consulate at Canton eventually becoming head of the legation at Canton in 1857. Appointed consul at Shanghai (1861), he left there for diplomatic work in Japan in 1865. Returning to China in 1883, he took over the legation at Peking, carried through a valuable treaty with Korea, and acquired Port Hamilton for a Brit. coaling station in the N. Pacific.

**Parkes, Sir Henry** (1815-96), Australian statesman, b. Stoneleigh, Warwickshire. Possessed of very little education, he worked for some time as a labourer, but emigrated to Sydney in 1839, where he found more congenial employment. During his spare time he developed a taste for literature, publishing a small vol. of poems, *Stolen Moments*, in 1842. He became interested in politics, and in 1849 started the *Empire* newspaper, in which he expressed his views against the transportation of convicts. For some years he represented E. Sydney in the Legislative Assembly. P. came to England in 1861 as a commissioner for promoting emigration. On his return he was made colonial secretary in 1863, and when the Martin ministry resigned, in 1872, became Prime Minister, to which office he was 5 times re-elected. His financial position was never strong, and he died, a very poor man, at Sydney. P. was instrumental in passing the Public School Acts of 1866, and worked hard in the cause of Australian federation. See life by T. Bavin, 1941; M. D. McLaurin, *Sir Henry*, 1946.

**Parkes**, tn in Ashburnham co., New S. Wales, Australia. 277 m. WNW. of Sydney. It is mainly a wheat-growing and sheep-grazing area. Pop. 8100.

**Parkhurst**, see NEWPORT.

**Parkinson, James** (1755-1824), physician, b. Hoxton, London, son of a surgeon, to whom he was apprenticed. Nothing is known of his early years. He practised all his life in Hoxton. His name is perpetuated in 'Parkinson's disease' (paralysis agitans), of which he gave the first description in his *An Essay on the Shaking Palsy*, 1817. He was also one of the first medical politicians, wrote a useful *Chemical Pocket-Book*, 1799, and was a geologist of considerable merit (he wrote *Organic Remains*, 3 vols., 1804-11, and *Outlines of Oryctology*, 1822). See James

*Parkinson, 1755-1824*, ed. by M. Critchley, 1956, which includes a memoir by W. H. McMenemey and reproduces the famous *Essay*.

**Parkman, Francis** (1823-93), Amer. historian, b. Boston and educated at Harvard. He devoted his life to historical writing, as a rule taking for his subject the struggle for power between England and France in Canada. His books are still standard authorities on the hist. of colonial N. America. His prin. works are *The Conspiracy of Pontiac*, 1851, *The Pioneer of France in the New World*, 1865, *The Jesuits in North America*, 1867, and *Montcalm and Wolfe*, 1884. See M. Wade, *Francis Parkman: Heroic Historian*, 1942, and (ed.) *The Journals of Francis Parkman*, 1949.

**Parlement**, the Fr. tribunals which before 1789 were invested with sovereign judicial authority, and political and magisterial powers which eventually made them instruments of monarchical tyranny. According to Loysseau and Machiavelli, the P.s saved feudal France from dismemberment as in Italy and Germany, for most of the Fr. kings developed their powers as a weapon against feudality, and gave them, as far as possible, an independent status. This supreme power was soon turned against the monarchy, and in the reign of Louis XII the P. acted as a mediator between the king and the nation. Under Louis XIII the pretensions of the P. increased, especially after the dissolution of the États Généraux of 1614. It censured the queen, extravagance of all kinds, and the shackles put upon justice by the court and the nobility. In the ensuing struggle between the P. and the monarchy, the former was completely humiliated by the boldness of Cardinal Mazarin. On the death of Louis XIV the P. attempted to recover its old authority, tore up the will of the late monarch as it had that of his predecessor, and formally took the name 'sovereign court.' In 1762 the P. acquired tremendous popularity by declaring the abolition of the society of Jesuits, and in despoiling that society of its property. Finally, in 1792 the P. was abolished on the ground that the nation had never concurred in the election of its members. It is possible to regard the birth of liberty in France as synchronous with the abolition of the P.s, but Fr. historians acknowledge their services for France and the splendid characters they formed.

**Parley, Peter**, see GOODRICH, SAMUEL GRISWOLD.

**Parliament. ORIGINS.** Down to the revolution of 1688 the hist. of the Eng. P. reflects the struggles between the king, the nobility, and the people. After that date it becomes the hist. of the struggle for electoral reform, of the doctrine of ministerial responsibility, and of the party system. The landmarks of the pre-revolutionary period are the resistance of the king and the people, in alliance, to the tyranny of the feudal barons, and, later, the alliance of the barons and people against the encroachments of the royal prerogative; the admission to P. of the

medieval burgesses ostensibly to be consulted on taxation (the beginning of popular representation); the alternating concentration of power, first in the hands of the monarchs and then in the commons, between the end of the 13th cent. and the close of the Tudor period; the struggle, during the Stuart period, between the protagonists of the divine right of kings and the supporters of parli. privilege and lawful taxation, complicated by questions of religion; and the limitations of the royal prerogative as embodied in the Bill of Rights.

The term P. was probably first used in England by Matthew Paris (q.v.) in 1246, and introduced through the Normans or through intercourse with the Fr. kingdom. It is also used retrospectively by later writers, and in a record of the twenty-eighth year of Henry III the assembly in which Magna Carta was signed is mentioned as the 'Parliamentum Runnymede.' No precise meaning can be given to the term by reference to the class of persons that constituted the national assembly, though some historians differentiate the deliberative assemblies of the Plantagenet monarchs at and after the time of Simon de Montfort's celebrated P., by calling them 'P.s' as opposed to the 'Magnum Concilium' of the previous period. In spite of the despotic power to which some Eng. monarchs have attained, a national assembly of sorts can be traced back to Saxon times. This distinguishes the hist. of England from that of every other European kingdom. The Witenagemot becomes the Great Council, and the latter the bicameral P. But the A.-S. folk-moot, though a popular assembly which declared the law or custom of the countryside, was a localised institution, and did not deliberate such great matters as war and peace; and the Witenagemot was an aristocratic assemblage in the constitutional powers of which the people at large did not participate. It is possible that the people had some definite right to attend, e.g. when a new king was to be elected, but there is no evidence that they habitually did so; and we may, therefore, regard the Witenagemot or the later Magnum Concilium, or Council of Magnates, as the forerunner of the House of Lords, and perhaps the assembly at Runnymede as the lineal progenitor of the House of Commons, though until the year 1295 there appears, in spite of the frequent summonses of the burgesses to attend, to have been for the most part but one legislative chamber. The struggle between the king and the greater feudal barons was probably the predisposing cause of popular liberties; for the kings, at a time when William the Conqueror's notions of the appropriate relations between the kingship and the feudal hierarchy of tenants were as yet in the balance, generally found themselves forced to secure the support of the people at large, with the result that some idea of popular liberties slowly emerged, although largely in the land-owning class. The judicial, fiscal, and legislative reforms of Henry II sealed the doom, not

only of the barons, but also of any future monarch who should disregard the type of Eng. government and administration crystallised in those reforms. Thereafter the opposing forces were usually the king (and his foreign favourites) and those barons who, excluded from power and privilege, sought to win control over the Crown. The Commons were from time to time drawn into alliance with baronial factions, but attempts to introduce continuous control of the Crown broke down in face of the barons' reluctance to undertake such an onerous task. Finance and judicial business were the chief concerns of the representatives, and the king's court estab. a superiority in these matters over local feudal courts. P. was (and is) the 'high court.' 'No taxation without representation' has been the peculiar genius of Eng. government at almost all times, and Englishmen were familiar with the idea of representation long before the reign of John; for the king's officers (generally circuit judges) used to arrange financial matters with the commons' representatives in the shape of the recognitors of the grand assize (the progenitors of the modern co. member) and deputies sent by the bor. inhab. (the forerunners of the modern burgess). See BURGESS; ELECTORATE; JURY; REPRESENTATION.

The representative principle became further developed in the reigns of John and Henry III, when co. and bor. representatives were occasionally summoned to meet either the king or the barons in London or other tns. to confer about taxation. These conventions prompted a desire for a national P., though it was not till Edward I that a P. was summoned which consisted of representatives of all the estates of the realm (q.v.), viz. archbishops, bishops, superior clergy, barons, knights of the shires, and burgesses. Before De Montfort's famous P. of 1265 there were only 4 instances of co. representatives being summoned to the national council, in 1213, 1254, 1258 (the 'Mad Parliament'), and again in 1258. The prin. if not the only business was financial matters. Strictly the wording of Magna Carta required the king to consult the people's representatives on taxation; and as there already existed a recognised machinery in the shire-moots for the election of knights to nominate recognitors in civil suits (in other words, a working system of co. representation generally), the Crown had still less justification for abstaining from summoning at least the knights of the shires. The burgesses or tn representatives, however, were not called on until Simon de Montfort, earl of Leicester, who may be termed the creator of the House of Commons. The writs which he issued in 1264 required the sheriffs to return not only 2 knights from each shire, but also 2 citizens from each city and 2 burgesses from each bor. Henry III, though he called the burgesses to the national assembly, had no desire to consult them on matters of state; and indeed Edward I would appear to have favoured the idea merely because it was

an easier way of raising money than by a purely arbitrary method. But though the representatives were long ignored in legislation and deliberation generally, the fact that they were summoned regularly in time gave them political status. Moreover, although, at first, knights and burgesses deliberated and voted apart, the former soon forgot the fact that the representatives of the wealthy cities were socially their inferiors, and began to join with them in petitions for legislation. This alliance was made easier by the fact that younger sons of noble families, being excluded from rank by the heirs, were plain esquires. Finally, the knights broke away altogether from the greater barons or hereditary legislators, and sought the House of Commons as their appropriate sphere. By the reign of Edward III the Commons had become much bolder, and not only successfully asserted a right to veto enactments affecting the people at large, but declared to the king in P. that they 'refused to be bound by any of his statutes or ordinances unless made with their assent.' The Crown interested itself in the composition of the Commons (see ELECTORATE).

Since Magna Carta no king had questioned the right of the com. to send their representatives to P.; but the Crown did not hesitate to dispute the bor. representation, and in consequence sev. Acts were passed to check the Crown's attempts in this direction. These attempts generally took the form of incorrect returns of members by the Crown's nominees, the sheriffs. In Richard II's reign an Act was passed fining sheriffs who made false returns, and in the time of Henry IV the justices were empowered by statute to inquire into the same abuses. After the House of Commons was estab. as a separate legislative body, it began itself to restrict the suffrage (see ELECTORATE), e.g. an Act was passed in 1430 to restrict the co. franchise, formerly possessed by all freeholders, to those whose freeholds were worth 40 shillings a year. Towards the close of the Middle Ages, P. declined, more and more of the general petitions which were a chief function being referred to the executive branch of the gov. This process, analogous to the decline of P.s in France, Spain, and Germany, was halted only when the Tudors recognised the importance of attaching mass opinion to their benevolent dictatorship. Under the Tudors P. was at first entirely subject to the king; it was rarely summoned by Henry VII, or during the first part of the reign of Henry VIII. It was not until the latter years of Elizabeth's reign that the Crown's ascendancy began to be challenged. The dangers of civil war lingering on from the Lancastrian-Yorkist factions, and the need for a strong gov. to stamp out the remnants of baronial lawlessness, enabled Henry VII to maintain with ease the ultimate power of the Crown. To him P. was useful, but it was by no means necessary. Yet its usefulness in canalising popular support gave it some importance, and an effective resistance was later made

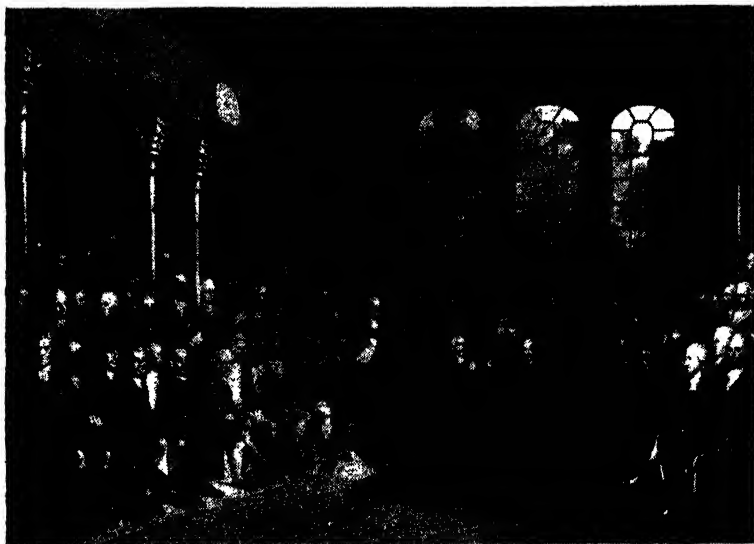
to Thomas Cromwell's attempts to introduce a standing army and other means of unlimited royal autocracy. In Henry VIII's reign P. was establishing a continuity important for the future. The breach with Rome was effected through P. and with parl. approval, since a façade of popular action was thus built up. Yet the fact that Henry used and consulted P. gave the institution an ever-increasing importance. The Sp. menace and the fear of Rom. Catholicism demanded a strong central authority, but after the defeat of the Armada a new spirit began to manifest itself, and Elizabeth's latter years were marked by an ever-growing independence of speech and action by P., complicated by the conflict between Puritanism and the Anglican Church. Repeatedly Elizabeth declared that there were topics—such as her marriage, religion, and foreign affairs—which were not to be considered matter for parl. concern, and repeatedly the more progressive elements denied this restriction. The Commons indeed came into collision with Elizabeth on sev. occasions, e.g. on the question of the queen's marriage and the settlement of the succession 1566; on eccles. matters, 1571 and 1593; and on monopolies, 1601. The control which the council had exercised over parl. deliberations began to give way to a new group of Commons leaders. With James I and Charles I this process developed with growing speed to the inevitable outcome in civil war. With all the Englishman's concern for precedent and legality, Crown and Commons appealed to the past. The lawyers became leaders in P., since they could produce justifications for parl. claims which were practically effective if theoretically doubtful; they could draft bills and organise business; and they were supported by the legal knowledge which almost every Stuart gentleman acquired as part of his education. The Stuarts claimed a theoretical divine right of kingship which was no less irritating because the Tudors had enjoyed it in actual practice. That the Crown also supported the estab. church added a further source of conflict with those of the commons who had embraced the Puritan beliefs. Once the claim of taxation without parl. approval had been advanced, and material interest reinforced religious and political ideas, compromise became impossible.

During the interregnum a period in which P. undertook executive authority was followed by one in which it lost all authority to Cromwell, whose rule convinced the nation that irresponsible gov. was not to be tolerated. The folly of James II reinforced the lesson, and the peaceful revolution of 1688 marked the beginning of parl. dominance over the Crown, and of the responsibility of the executive to P.

The clause in Magna Carta against the imposition of arbitrary aids found renewed expression in the Bill of Rights, which made illegal the levying of money for the Crown by pretence of prerogative, without leave of P. The Bill of Rights

gave the death-blow to prerogative for all time, and made it clear that the king was a monarch with powers limited by P. Henceforth the hist. of P. is that of party gov.: the wielding of the prerogative power by the party in the majority in the House of Commons, or rather by the Cabinet (*see* CROWN; CABINET; PARTY GOVERNMENT). The Crown was reduced to the exercise of personal influence, and even that suffered from the alien manners and speech of the first 2 Georges. But the victory over prerogative achieved by the revolution of 1688 was a far cry from

the greater barons were those who in their military, fiscal, and legal transactions dealt directly with the king, while the lesser transacted their business with the sheriff. If Simon de Montfort was the creator of the House of Commons, Edward I created the House of Lords; because even after 1215 the greater barons were by no means a strictly defined class, and it was merely by reason of Edward I's consistent exercise of his power to select those whom he chose to be summoned by special writ that the demarcation of the hereditary legislator from



*National Portrait Gallery*

THE HOUSE OF COMMONS, 1793

Pitt is addressing the House. From the painting by Karl Anton Hickel.

the ideals of a democratic P.; for there followed the tremendous struggle for electoral reform and the disfranchisement of the 'rotten hors.' that culminated in the Reform Act of 1832. The subsequent hist. of P. has been treated both historically and critically in PARTY GOVERNMENT: CABINET; ELECTORATE; and POLITICS. The hist. of the House of Lords is to a great extent that of the Privy Council (q.v.), or rather of the Great Council of the Saxon and Norman kings out of which sprang the Privy Council, the Cabinet, the executive depts of state, and the high court (*see* CABINET; PRIVY COUNCIL; GOVERNMENT). It is important, however, to notice that before Magna Carta a distinction had grown up between the *maiores* and *minores barones*, and that by Article 14 of the charter the former were to receive a special writ and the latter a general writ, calling them to P. In fact,

titled persons not to be so highly honoured resulted. (*See also* NOBILITY on the principle of the hereditary right to the privileges of the peerage.) The House of Lords has undergone no essential change in its composition ever since that composition was stereotyped in the Middle Ages, though occasionally life peers sat in the House. Since the decision of the Committee of Privileges in the Wensleydale case (1856) no life peer, except spiritual peers and the lords of appeal in ordinary, has been allowed to sit in the House of Lords. The more recent hist. of the House of Lords will be found in the article REFORM OF THE HOUSE OF LORDS.

MODERN TRENDS. The imperial P. no longer legislates for the dominions or the greater part of the commonwealth, and it ceased to do so long before the Statute of Westminster (q.v.). Nor does it now venture to pass bills of attainder or confiscate

property or deprive people of life and liberty without due process of law, excepting in very rare cases. Yet theoretically it can do all these things, for there is no legal limit to what P. can enact. By contrast with the Amer. political system of checks and balances, the Eng. is designed, not unsuccessfully, to make it easy to determine what general line of policy shall be followed, and by what individuals it shall be carried out. In America it sometimes seems that the people authorise the president to follow some clear-cut policy, while at the same time they give authority to Congress to act differently, and to the supreme court to prevent either president or Congress from acting unconstitutionally. But democracy in England, which reduces the influence of personalities to the few leaders on either side, means the choice of a gov. with almost plenary powers. Hence, in the past, 'third' parties have faded out of the Eng. parl. scene, because the Eng. voter is averse to throwing away his vote on lost causes, although today a minority of the electorate still support the Liberal party. It is no doubt true that among the principles for which Wilkes successfully fought was the right of the electors to choose what candidates they liked for P. To-day the average constituency party may generally be willing to adopt a candidate recommended by the party machine; but it retains the ultimate power of selection, and sometimes exercises it against the wishes of party headquarters. In the eyes of an Amer. critic a parl. system in which complete power is put into the hands of a small group of men restrained only by public opinion and tradition seems undemocratic. For in the Amer. political system power is deliberately divided, little or no trust being reposed in the discretion of either the executive or the legislative power, while minorities have ample legal powers to impede the action of majorities. P. is a more important institution in the Eng. system than Congress is in the Amer., because it does not share its powers with a president or a court over which it has no direct control. Yet members of P. are less important than congressmen, because they delegate most of their powers to the ministry. This is not, however, undemocratic, for the Eng. voter at an election is primarily choosing a governing (majority) party and a Prime Minister, so that really the House of Commons is a kind of electoral college and national convention combined.

**POWER AND JURISDICTION.** The 'transcendent and absolute' power of P. for making laws was asserted by Coke, and Blackstone and Dicey use language to the same effect. P. is constituted by the Sovereign, the Lords, and the Commons, who together exercise the legislative functions. But each has other and separate functions. The whole executive authority resides in the Crown. Legislation is not the sole or even the more important function of either House. The Lords have an important part in revising legislation sent up from the Commons;

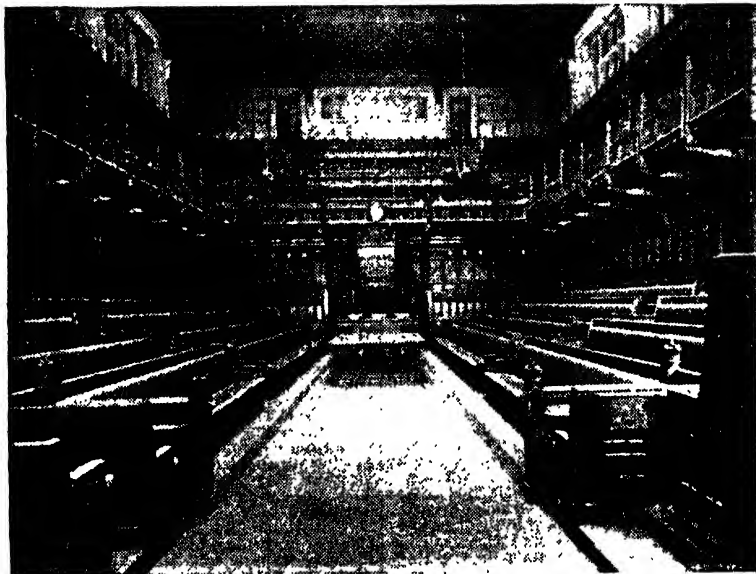
and it is also a forum for debates on topics of the day which can often be discussed by peers with expert knowledge, and in an atmosphere free of the excessive political heat engendered by controversy in the elected House. But its chief distinction lies in its exercise of judicial functions, as the ultimate court of appeal. The power of the Commons derives from its absolute right of imposing taxes and voting money for the public service, fulfilling the principle of representation and consent to taxation. The greater part of its time is occupied with financial business. In substance, P. controls legislation, as it does administration, by debating and ultimately approving the policy of the gov. If the Commons as a whole is hostile to the gov. it can compel it either to resign or to dissolve P. This is unlikely where the gov. possesses a party majority; but normally the gov. has at its command a stable parl. majority, which it controls partly by its power to dissolve P. Thus, though in one sense the House controls the gov., in a more practical sense the gov. controls the House. When the gov. has a majority in both Houses, the 'transcendent and absolute' authority of P. is the authority of the gov. But it is not really transcendent and absolute, for behind both gov. and the House of Commons is public opinion, which can quickly transform the whole parl. scene in times of emergency, as, for example, when in 1940 Neville Chamberlain's Gov. collapsed, and gave way to the Coalition Gov. of Winston Churchill.

While P. can, within the limits of public opinion, decide anything, a member of the Commons cannot bring forward any motion at any time he thinks fit, for the activity of private members is limited. The importance of the absolute legal authority of P. is that, as there is no constitutional limitation on legislation, there is no topic which the House cannot discuss, though not all matters can be discussed with equal facility, e.g. under a rule over two centuries old, if a Bill involves expenditure it can proceed beyond its second reading only if a minister introduces a financial resolution. In short, the 'transcendent and absolute' power of P. places enormous power in the hands of the gov., but it is not a power which can be seriously abused, for abuse would lead to retribution at the hands of the House of Commons or the electorate. Because it is a democratic system the Brit. parl. system can afford strong gov., and does not require constitutional limitations upon parl. authority (see W. Ivor Jennings, *Parliament*, 1939).

**CROWN AND PARLIAMENT.** By virtue of the prerogative the Crown is entitled to summon, prorogue (see PROROGATION), and dissolve P. On the accession of a new sovereign P. must assemble without delay (see DEMISE). The monarch does not pay official visits to P. except on stated ceremonial occasions, viz. at the opening of a parl. session. He (or she) can, but does not, personally attend to assent to Bills that have passed the

Houses. The formal ceremonial of the speech from the throne at the opening of a session is intended to indicate the nature of the state's relations with other countries, and generally to outline the gov. programme of legislation. To bring the name of the sovereign into debate in order to influence the opinion of the House is contrary to parl. etiquette, and no member is allowed to speak slightly of the sovereign. The monarch may dissolve P. when he chooses, but his discretion has become the constitutional privilege of the

England and *Parliamentary Procedure* (successive eds.); A. F. Pollard, *Evolution of Parliament*, 1920; W. I. Jennings, *Cabinet*, 1936, *Parliament*, 1939, *Manual of Procedure in the Public Business of the House of Commons* (7th ed.), 1942, and *The Queen's Parliament*, 1954; J. E. A. Jolliffe, *Constitutional History of Medieval England*, 1937; H. J. Laski, *Parliamentary Government in England*, 1938; C. K. Allen, *Law and Orders*, 1945; G. Keeton, *The Passing of Parliament*, 1952; Strathearn Gordon, *Our Parliament* (4th ed.),



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THE INTERIOR OF THE HOUSE OF COMMONS, LOOKING NORTH

Cabinet (q.v.). The mode of dissolution is by proclamation (q.v.), issued technically by the advice of the Privy Council (q.v.). Either House may adjourn for any period it likes; and generally adjourns for about 3 months from Aug. to Oct. The Crown has a statutory power to order a resumption of business when both Houses stand adjourned for more than 6 days. That P. must meet at least once a year is guaranteed by the fact that money for the public services is provided by ann. acts, and no demand for taxes would be legal unless it did meet (see Dicey's *Law of the Constitution*).

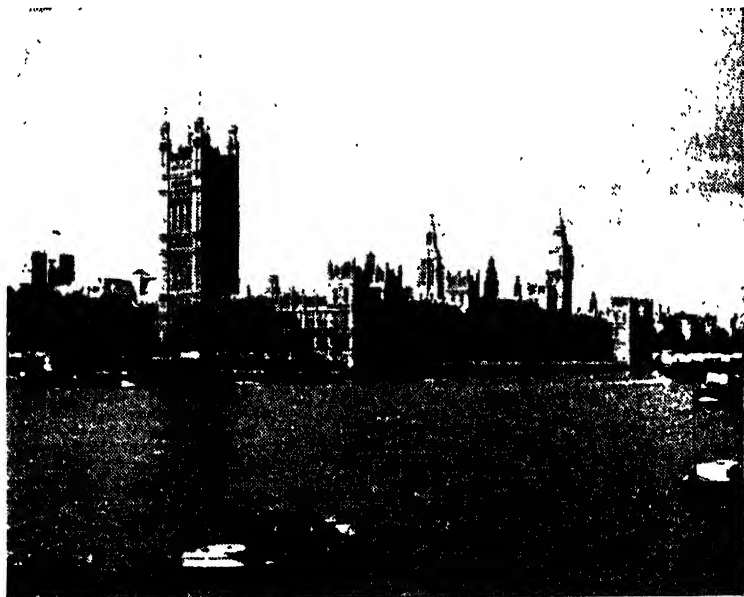
See HOUSE OF LORDS; REFORM OF THE HOUSE OF LORDS; HOUSE OF COMMONS; COMMITTEES, PARLIAMENTARY; PARLIAMENTARY PRIVILEGE; PARLIAMENTARY BILLS; GOVERNMENT; BRITISH COMMONWEALTH; and other Parl. entries. See Sir T. E. May, *Constitutional History of*

1952; Herbert Morrison, *Government and Parliament*, 1954; H. R. G. Greaves, *The British Constitution* (3rd ed.), 1955; J. F. S. Ross, *Elections and Electors*, 1955.

Parliament, Houses of, officially known as the Palace of Westminster, being originally a royal residence from the time of Edward the Confessor (who built the original palace) until Henry VIII. Additions and alterations were made at various times. In 1512 they were damaged by fire; Henry VIII later took York House (renaming it Whitehall Palace) from Wolsey, built St James's Palace, and abandoned the Westminster residence. In 1547 Edward VI granted the use of its chapel of St Stephen to the Commons, who had hitherto met in the chapter-house of Westminster Abbey, and there they remained until a fire in 1834 destroyed all the palace except Westminster Hall, the crypt of St

Stephen's Chapel, and the cloisters. A new Palace of Westminster was begun in 1840 in a rich adaptation of Gothic designed by Sir Charles Barry, assisted by A. W. Pugin; the lords occupied their chamber in 1847, and the formal opening by Queen Victoria followed in 1852. After Barry's death (1860) the completion was carried out by his son E. M. Barry. The House of Commons was destroyed by bombs in 1941. A new chamber designed by Sir Giles Gilbert Scott, substantially on the lines of the former building, was begun in 1948 and formally

Lords, a brilliantly decorated chamber. The thrones for the sovereign and consort, designed by Pugin, stand at its S. end; and in front of them is the Woolsack, traditionally held to have been placed in the house in the reign of Edward III. Wool was the staple commodity of England at this period, and the use of it for the Woolsack may have some connection with the court of the major of the Wool Staple that used to sit at Westminster. Formerly judges were directed to sit on woolsacks; now they do so only when attending the opening of parliament.



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THE HOUSES OF PARLIAMENT AND BIG BEN

opened on 26 Oct. 1950. Every part of the Commonwealth contributed some kind of furnishing for the new chamber. The exterior features of the H. of P. include the Clock Tower, 316 ft high, containing the hour-bell known as 'Big Ben' after Sir Benjamin Hall, who was first commissioner of works when it was installed; statues of A.-S. kings on the N. front; 300 statues of sovereigns and saints and a terrace on the river front; and the Victoria Tower, 336 ft high, at the S. end.

The public entrance is by a door in Old Palace Yard (the royal entrance is through the Victoria Tower) which, via the Royal Staircase, the 'Norman Porch', and the King's Robing Room leads to the Royal Gallery, which is crossed by the sovereign when opening parliament. The Princes' Chamber beyond leads to the HOUSE OF

The Woolsack in front of the Thrones is the seat of the lord chancellor. At the other end of the chamber is the Bar, at which the members of the Commons attend to hear the speech from the Throne at the opening of parliament and to hear the royal assent to acts of parliament. Also at the Bar are heard the final appeals on lawsuits. The seating for the peers is ranged the length of the chamber; the cross-benches are reserved for princes of the blood, and the seats on either side of the Thrones are for ambassadors and distinguished visitors. Above are the strangers' and press galleries. The chamber was used by the Commons, after a brief tenure of Church House, Westminster, when their own was bombed, the lords the while using the King's Robing Room. The N. end of the chamber leads

to the Peers' Lobby and the Peers' Corridor, then into the Central Lobby, with elaborately carved bosses, used with the adjoining Waiting Hall by visitors and constituents calling to see M.P.s. The panels over the 4 great doorways are filled with glass mosaic pictures of the 4 patron saints of the constituent countries of the U.K.: Saints George, Andrew, David, and Patrick. N. of this lobby is St Stephen's Hall, standing on the site of St Stephen's Chapel, founded originally by King Stephen in 1141 and rebuilt under Edward III as a collegiate chapel. Below it is the crypt dating from 1292-1327, and N. are St Stephen's Cloisters, a late Gothic structure, c. 1526-9. N. of the Central Lobby is the Commons Corridor leading to the Commons Lobby, and the Churchill Arch at the N. end, constructed of masonry from the bombed building, leads into the HOUSE OF COMMONS. The Speaker's Chair is at the N. end. The benches on his right are occupied by the members of the party in power, those on his left by the party in opposition, the front benches being occupied by cabinet ministers and opposition leaders respectively. Although the number of M.P.s is 630, there is seating for only 438. In front of the speaker's chair is the Clerk's table, upon which the Mace (symbol of the speaker's authority from the sovereign) is placed when the house sits as a house, but below the table when the house goes into committee (*see* COMMITTEES, PARLIAMENTARY). Above are the galleries for distinguished strangers, other strangers, and the press. The division lobbies are on the W. and E. sides of the chamber. The house is in session from Jan. to July, with adjournments at Easter and Whitsuntide, and then again from Oct. until Christmas. When it is sitting a light shows at night from the Clock Tower, and by day the Union Jack flies from the Victoria Tower.

The H. of P. are full of statues, paintings, and other representations of incidents and personalities in Eng. hist., more especially those connected with parliament. There is a multitude of rooms for all purposes ancillary to the work of the governing and legislative chamber, and for the purely social side. These include libraries, ministers', committee and law officers' rooms, dining- and smoking-rooms, and the Speaker's Residence is at the NE corner. Old Palace Yard, lying between the H. of P. and Westminster Abbey, is the site of the inner court of the palace built by Edward the Confessor. It later became a place of execution. Guy Fawkes and Sir W. Raleigh were executed here. New Palace Yard, at the NW. corner, was the courtyard of the new palace projected by William II, of which only the banqueting hall (Westminster Hall, q.v.) was built. This yard also became a place of execution.

*See* Sir Bryan H. Poll, *The Houses of Parliament*, 1950; Maurice Hastings, *Parliament House*, 1950.

**Parliamentary Agents**, persons who conduct the business of promoting private

Bills and proceedings upon petitions against such Bills in Parliament. Various duties and responsibilities are imposed on P. A. by orders of both Houses. No person may act as a P. A. until he has subscribed to a declaration engaging to observe the rules and practice of Parliament, and to pay all fees in respect of any petition or Bill upon which he appears, and has entered into a bond to observe such declaration. Persons other than solicitors or writers to the signet must apply in writing to the clerk of the private Bill office in order to qualify as a P. A., and must produce a certificate of respectability from a member of Parliament, barrister-at-law, or solicitor. No person is allowed to be registered as a P. A. unless he is employed in promoting or opposing some private Bill or petition pending in Parliament. The private Bill register in the private Bill office, containing the names of the town and country agents soliciting any particular Bill, may be inspected by the public. The P. A. perform the useful function of examining Bills on behalf of those affected who have neither the skill nor time to do it themselves. Many organisations such as the Federation of Brit. Industries, and associations of employees, employ P. A. to watch their interests.

**Parliamentary Bills.** A Bill is the working draft for intended legislation, the form in which an Act of Parliament first appears. There are three general categories—*public Bills*, dealing with matters of public policy, whether introduced by the Gov. or by a back-bench member (when they are distinguished by the description 'private members' Bills' as distinct from 'private Bills'); these public Bills include the second category, *money Bills*, relating to the imposition of taxes and the spending of money; and *private Bills*, defined in broad terms as being for the benefit of a person or body, e.g. local authorities and public utilities.

Most *public Bills* are introduced by the Ministry. There are limited opportunities for back-bench members to initiate legislation, and some notable social reforms have been brought about by this means; but the days set apart for this are few, there is a ballot at the beginning of each session for priority, and the hazards on the long road to the statute book are many. Bills other than money Bills may originate in either House.

The passage of a Bill through its several stages is the same in the two Houses. A Bill can be brought in by resolution of the House or presented by simply giving notice on the order paper. Its first reading has become a formality, leading to the Bill being printed and circulated to all members. The second reading is the all-important stage, when the main principles are discussed and voted upon; amendments can be moved for the rejection of the Bill, either declaring the reasons for so doing in a 'reasoned' amendment, or simply deferring the second reading to an ineffective time outside the session by the formula 'this day three (or six) months.' If the second



reading is carried the Bill is automatically referred to a standing committee (see COMMITTEES, PARLIAMENTARY) unless the House orders otherwise. The Lords normally take the committee stage in the whole House. In the Commons some Bills (consolidation, appropriation, and those imposing taxes) are always referred to the whole House, and Bills arousing major political controversy generally are. In the committee stage the contents of the Bill, its clauses and schedules, are examined in detail, and amendments made by agreement or on a majority vote. Whether occurring in the whole House or standing committee, this is a lengthy and laborious process, and the promoters of the Bill must be on the alert to detect and resist destructive or damaging amendments produced by the objectors. When a measure is hotly disputed and makes insignificant progress through the committee the Gov. can resort to special powers, commonly called the 'guillotine', to limit the time taken on the Bill as a whole and its sev. sections. When the committee examination is completed the Bill is returned to the House, and in its amended form reviewed by the full House on the 'report' stage. This affords a useful opportunity for reconsideration and decision on points reserved during the committee stage for further examination. (It is sometimes valuable to the Gov. as an occasion to reverse a decision taken by the committee against their wishes.) After the report stage the Bill moves forward to its third reading, when final judgment is pronounced upon it. (In the Lords this stage also is used to make amendments in its provisions.) After the third reading the Bill is sent to the other House to go through the corresponding procedure there.

Differences may sometimes arise because of amendments made by one House against the wish of the other. If these disagreements cannot be resolved the Bill is lost. The amendments in dispute are sent back from the one House to the other, with the reasons for disagreement stated. Negotiations are conducted between the two Houses, and agreement is sought in a compromise or by one House, in order to save the Bill as a whole, not insisting on its view prevailing.

The main purpose of a *money Bill* is the expenditure of money or the imposition of taxation or a public charge. It must be founded on a resolution passed in committee of the whole House. When certified by the speaker, who has sole discretion, a money Bill must be passed by the House of Lords, without amendment, within a month of being received from the Commons; otherwise it is presented to the sovereign for the royal assent and becomes an Act without the assent of the Lords. When both Houses are agreed the Bill is presented for the royal assent, nowadays signified by a commission consisting of 3 or 5 peers, and becomes an Act of Parliament. A special procedure has been introduced for exclusively Scottish Bills, which have the equivalent

of a second reading debate in the Scottish Standing Committee, as well as the committee stage.

*Private Bills* are subject to a separate code of regulations, in which a quasi-judicial procedure is combined with the process of passing legislation through the two Houses. Most private Bills are local in extent, and deal with such matters as boundary extensions or by-law powers; or authorise public service corporations and utility undertakings to exercise financial powers or carry out specified works. A few are more personal and individual, relating to matters such as naturalisation, divorce, change of name, and title to estates. All of them originate by petition.

The procedure requires that full notice be given so that interested parties may have an opportunity to be heard, and to this end the proposals are required to be publicly advertised, detailed plans deposited for examination, and owners and occupiers affected served with due notice. These matters are governed by a time-table related to the beginning of the session, and the Chairman of Ways and Means and the Lord Chairman of Committees arrange in which House a Bill shall be first considered. Private Bills are read three times in each House as public Bills, but this is formal unless objection is taken. On second reading the House can by resolution instruct the committee to which the Bill is referred what action it shall take on specified clauses or provisions. Private Bills are examined at all other stages by select committees (sometimes for convenience joint committees) which function as semi-judicial bodies, hear counsel on behalf of the contending parties, and examine witnesses. Private Bill procedure covers also the simpler and cheaper process of provisional orders, and its modern variant under the Statutory Orders (Special Procedure) Act of 1945. There is separate provision in this category for Scotland under the Private Legislation Procedure (Scotland) Act.

**Parliamentary Committees, see COMMITTEES, PARLIAMENTARY.**

**Parliamentary Deposits.** The promoters of private Bills in which authorisation is sought to carry out undertakings which may prove abortive shall make a deposit of money as a guarantee of good faith. The deposit is to be returned to the promoters where non-completion of work is due to want of compulsory powers. No deposit is required where the money needed for works is intended to be raised on the security of rates and no private profit is to be made.

**Parliamentary Privilege** is defined in *Erskine May* as 'the sum of the peculiar rights enjoyed by each House collectively as a constituent part of the High Court of Parliament, and by members of each House individually, without which they could not discharge their functions, and which exceed those possessed by other bodies or individuals.' The Lords possess in addition special privileges deriving from the peerage. The House of Commons

has particular privileges which have been stated in these terms—'The sum of the fundamental rights of the House and of its individual members as against the prerogatives of the Crown, the authority of the ordinary courts of law, and the special rights of the House of Lords' (Redlich).

Thus privilege is directly associated with the functions and service of either House: the unimpeded exercise by the House of its authority and functions, and the unhindered discharge by the members of their parl. duties. All privileges are founded either on the law and custom of Parliament or are defined by statute. While they have always been enjoyed by the Lords 'because they have a place and voice in Parliament,' the Commons had to struggle hard and long to assert their right to them, against the Crown and against the Upper House. At the opening of every Parliament, the speaker, after his election, makes a specific claim on behalf of the Commons to their ancient and undoubted rights and privileges, naming particularly freedom from arrest and molestation, liberty of speech in debate, and access to the sovereign whenever occasion shall require. The sovereign's confirmation of the claim 'in full and ample measure' is intimated by the lord chancellor and formally reported by the speaker to the Commons. No new privilege, however, may be created. This limitation has existed since 1704, when a resolution to this effect was accepted in both Houses.

Freedom of speech includes the right of each House to exclusive control over its own proceedings and unfettered initiative in all matters of legislation and discussion. This was confirmed by the declaration in the Bill of Rights 'that the freedom of speech, and debates or proceedings in Parliament, ought not to be impeached or questioned in any court or place out of Parliament.' Freedom from arrest or molestation possibly originated in the safe conduct accorded to those journeying on the king's business, and was naturally adopted as essential to those concerned with the affairs of the High Court of Parliament. This privilege is limited in the Commons to the period of a session and a reasonable time before and after, while members are travelling to and from Parliament—according to general usage 40 days. A peer's immunity from arrest is by ancient custom continuous. In relation to civil actions the privilege is unquestioned, although with the virtual disappearance of imprisonment in civil process it has lost most of its value. It does not apply to the processes of criminal law. Treason, felony, and breach of the peace were excepted from the earliest times, and since the Wilkes case (1763) it has been considered that privilege could not be claimed for any indictable offence. Nor does P. P. extend to contempt of the courts of justice, or to bankruptcy (a member adjudged bankrupt is debarred from sitting or voting until the bankruptcy is discharged, and after 6 months

the seat of a member of the Commons becomes vacant). If an M.P. is arrested on a criminal charge the House must be informed, and if he is committed or sentenced the judge so acquaints the speaker. The right of a member of the Lords to trial by his peers has been relinquished. Associated with the privilege of freedom from arrest is the right of an M.P. to exemption from jury service. The former right of resistance to subpoena has been waived. The right of access to the sovereign, formerly essential to the Commons, is not now exercised in Parliament. Out of Parliament it is the modern custom to use it for the purpose of presenting Addresses to the Crown. It is a privilege of the House as a whole, through the speaker, and is not possessed by individual members. In recent times it has been confined to ceremonial occasions, as after the First and Second World Wars, and on the silver jubilee of King George V, when the two Houses presented Addresses of congratulation which were received by the King in the Royal Gallery. The Addresses which form part of the ordinary procedure of Parliament are communicated by members who have access to the sovereign as Privy Counsellors or officers of the Household. The House of Lords as a body is entitled to access to the sovereign, and each member of it as 'hereditary counsellor of the Crown' possesses individually the right of audience.

Both Houses claim the right to punish actions which offend against their privileges, whether of the whole House or of its members, and similar protection is extended to the officers of both Houses. What is commonly described as a breach of privilege (for example, some action which can be held to molest or obstruct a member in the discharge of his parl. duties, or to attempt to influence or intimidate him, or to reflect on him or on the House as a whole) is better described as a contempt. The power to commit to prison and impose fines has been held by the Lords, because of its judicial origin, since ancient times. The Commons had to assert the right, and it was not definitely admitted by the Lords until 1704 (but for more than 200 years it has not imposed fines). The Lords can commit offenders to prison for any specified term. The Commons is regarded as unable to commit for a term extending beyond the end of a session. These powers are used rarely, and only for the gravest offences. The usual action is for an offender to be brought to the Bar of the House and there admonished by the Lord Chancellor or the speaker, as the case may be. When a member of the Commons is adjudged guilty of contempt he can be punished by being suspended from the service of the House, or for more serious misdemeanour by expulsion. Such a sentence (or expulsion) resolved upon by the Lords against one of its members would disqualify a peer from sitting in the House. Complaints of breach of privilege when accepted are followed by a resolution referring the matter to the Committee of

**Privileges.** They examine the complaint and report to the House, which then decides what further action, if any, is necessary. Each House, having exclusive control of its own proceedings, has the right to discipline its members, regulate its own procedure, and exclude the jurisdiction of the courts. See also **PARLIAMENT**; **HOUSE OF COMMONS**; **HOUSE OF LORDS**.

**Parma:** 1. Prov. of Italy, in NW. Emilia-Romagna (q.v.). It is mainly in the Apennines (q.v.), but in the N. there is a broad plain which is watered by the Po (q.v.) and its tribs., the P., Taro, Enza, and Störone; the Po forms the N. boundary of the prov. The prin. tns include P., Fidenza, and Salsomaggiore (qq.v.). Area 1365 sq. m. Pop. 392,000.

2. It. city, cap. of the prov. of P., on the P. riv., 52 m. NW. of Bologna (q.v.). It was probably Etruscan (see **ETRURIA**) in origin, and was colonised by the Romans in 183 bc; it is crossed E-W. by the Aemilian Way (q.v.). In the 16th cent. it was the seat of the Farnese (q.v.) family (see *next art.*). The old walls remain, and there is an 11th.-cent. Romanesque cathedral, containing magnificent frescoes by Correggio (q.v.). There are other splendid churches, of which *S. Giovanni Evangelista* also contains work by Correggio, and *S. Maria della Steccata* contains the famous painting of 'Moses breaking the Tables of the Law,' by Parmigiano (q.v.). The Romanesque octagonal Baptistery (begun 1196) is celebrated, and there is a ducal palace, and also a univ. (1065). There is a large trade in agric. produce, and lace, silk, glass, and musical instrument industries. Pop. 122,000.

**Parma, Duchy of.** The former duchy of P. was created in 1545, when Pope Paul III (Alexander Farnese) invested his natural son, Pierluigi Farnese, with the duchy of P. and Piacenza. There were 8 dukes of P. of the Farnese line, and, after the line failed, the duchy was chiefly in Sp. hands. It twice came, for a time, under Austrian rule, until its conquest by the Fr. revolutionary armies in 1796. At the Congress of Vienna it was assigned to Maria Louisa, the wife of Napoleon, who was named Duchess of P., Piacenza, and Guastallo. Later the duchy fell to the Duke of Lucca. Finally, after the battle of Magenta, the duchy became a part of the new kingdom of Italy.

**Parmenides** (b. c. 515 bc), Gk philosopher, b. Elea, S. Italy. He wrote a poem *On Nature*, of which fragments survive. P.'s system marks one of the most important stages in the history of philosophy. In opposition to the earlier Monists, Thales, Anaximander, and Anaximenes (qq.v.), who maintained that the world had developed from a single element, P. held that there is no change or multiplicity. His argument involved an analysis of the verb 'to be,' which in turn drove later philosophers either to admit a plurality of original elements (as did Empedocles, Anaxagoras, and Democritus), or, like Plato and Aristotle, to discover another and immaterial kind of

being. See H. Diels, *Die Fragmente der Vorsokratiker*, 6th ed., 1951; J. Burnet, *Early Greek Philosophy*, 4th ed., 1945; F. M. Cornford, *Plato and Parmenides*, 1939; W. Jaeger, *Theology of the Early Greek Philosophers*, 1947.

**Parmenion** (d. 330 bc), Macedonian general. He was held in high esteem both by Philip and Alexander, the former of whom he served in the siege of Halus in 346 bc. He also took part in the battles of the Granicus, Issus, and Arbela, and being in command of the left wing of the army greatly distinguished himself. After the conquest of Drangiana his son, Philotas, was accused of plotting against Alexander's life, and the king, believing P. to be involved in the conspiracy, ordered him to be assassinated in Media.

**Parmeniera**, genus of fruit-bearing trees of the family Bignoniaceae, which flourishes in tropical countries. *P. coccinea*, which is known as the candle tree, is a typical example.

**Parmigiano**, Girolamo Francesco Maria Mazzola (1503-40), It. painter, sometimes called Parmigianino, b. Parma, an able exponent of the Lombard school, and the most distinguished of those who followed the style of Correggio (q.v.), somewhat exaggerating the height and slenderness of his figures. In 1523 he went to Rome to follow his studies, and was soon employed by Clement VII. He was in that city when it was stormed by the imperialists under Bourbon in 1527, and, it is said, was calmly at work on his picture of 'The Vision of St Jerome' (now in the National Gallery, London) when soldiers, bent on pillage, burst into his studio. He was, however, protected by their leader. Having agreed to execute sev. extensive frescoes in the church of S. Maria della Steccata, after repeated delays he was thrown into prison for breach of contract, and on being released he fled to Casal Maggiore, in the ter. of Cremona, where he died soon afterwards.

**Paranába:** 1. Riv. of NE. Brazil, rising in the SW. of the state of Piauí. It forms the boundary between Piauí and Maranhão, and after a course of 750 m. enters the Atlantic by 6 mouths.

2. Seaport of Piauí state, 175 m. ESE. of São Luís. It is of some importance for the export of tropical produce and cattle, and has an airfield. Pop. 31,000.

**Parnasse**, Le, name given to a school of Fr. poets who wrote for a review pub. by Alphonse Lemerre and ed. by Louis X. Ricard, called *Parnasse* and devoted entirely to poetry (1852-93). Among the chief poets were Stéphane Mallarmé, Verlaine, Lafenestre, and Theuriot. The chief characteristics of the school are beauty of style and plasticity of form, but it was gradually expanded and modified, developing ultimately into the school called Symbolist or Decadent. See M. Souriau, *Histoire du Parnasse*, 1930, and F. Vincent, *Les Parnassiens*, 1933.

**Parnassia**, a genus of perennial herbs, family Saxifragaceae, about 12 species native to N. temperate regions; *P. palustris*, Grass of Parnassus, is found in Britain.

**Parnassos**, mt (8070 ft) of Phocis, anct Greece, overlooking Delphi, the modern Lyakoura. It has 2 prin. peaks, called in classical times Tithorea and Lycorea, on the latter of which was the Corycian cave. It was regarded as one of the most holy mts of Greece, being one of the chief seats of Apollo and the Muses. It was also sacred to Dionysus.



L. J. Yell

#### SHEPHERDS OF MOUNT PARNASSOS

**Parnell, Charles Stewart** (1846-91), Irish politician, b. Avondale, Wicklow, entered Parliament as a member for Meath in 1875, and soon became a prominent member of the Irish Home Rule party led in the House of Commons by Isaac Butt (q.v.) who had founded it. He organised a policy of obstruction, which played havoc with the business of the House, and secured the support of the Fenians. He was in 1879 elected president of the National Land League, formed with the object of securing the ownership of land in Ireland for the occupiers. Shortly after the death of Butt in 1879 P. was unanimously elected to succeed him in the leadership of the Home Rule party at Westminster, and, because of his great influence over his followers, he was called 'the uncrowned king of Ireland.' In the autumn of 1881 he was imprisoned in Kilmainham jail for inciting to violence, but he was released in the following May, when an arrangement concerning Irish affairs, called the 'Kilmainham Treaty,' was arrived at with Gladstone. The murder of Lord Frederick Cavendish and T. N. Burke in Phoenix Park, however, upset all plans, though P. of course not

only had no connection with the crime, but denounced it in the House of Commons. In 1886, owing to the Conservatives and Liberals being nearly equal in numerical strength, he threw in his lot with Gladstone, and turned out the Conservative Gov. His price was the introduction of a Home Rule Bill, which was brought in and rejected. An appeal to the country resulted in the return of the Conservatives to power. In 1887 he was charged by *The Times* with having been actively concerned in the crimes perpetrated by the Land League. A special commission was appointed, and it was ultimately proved that the documents upon which *The Times* relied were forgeries by Richard Pigott (q.v.), who had sold them to the newspaper. P. was completely vindicated by the report of the special commission. Three years later P. was cited as co-respondent in a divorce action brought by Capt. O'Shea, a member of the Irish party, against his wife, and, being found guilty, Gladstone publicly stated that it was impossible for P. to remain leader of the Irish party. The majority of the party deserted him, and he retired from the leadership. In June 1891 he married Mrs O'Shea. He d. in the following Oct. See also HOME RULE. See T. P. O'Connor, *The Parnellite Movement*, 1889, and C. C. O'Brien, *Parnell and his Party, 1880-90*, 1957; also lives by R. B. O'Brien, 1898; W. O'Brien, 1926; St J. Ervine, 1928; H. Harrison, 1931.

**Parnell, Thomas** (1679-1718), poet, b. Dublin. Educ. at Trinity College there, he took orders in 1700, and was vicar of Finglas and archdeacon of Clogher. He was a friend of Swift and Pope, a contributor to the *Spectator*, and aided Pope in his trans. of the *Iliad*. He wrote various isolated poems, showing a fine descriptive touch, of which the most important are *The Hermit*, *The Night Piece*, and *The Hymn to Contentment*. There is an ed. of his collected works by G. A. Aitken, 1894, and all his poems are printed in *Minor Poets of the Eighteenth Century*, ed. by H. T. A. Fausset, 1930. See life by Goldsmith, 1770.

**Pärnu** (formerly German **Pernau**, Russian **Пернов**), seaport in Estonia, on the Gulf of Riga. Pop. (1956) 36,000 (c. 1914, 25,000). It was founded in 1256, and belonged variously to the Teutonic Knights, Poland, and Sweden; it was Russian 1710-1918. Cap. of P. Oblast within the Estonian Rep. 1952-3.

**Parochial Schools (U.S.A.)**. In the main these are institutions maintained by the Rom. Catholic Church, although there are also some Lutheran and Episcopalian and Jewish schools. From the very beginning of the Amer. rep., in the larger centres of pop. where there was a considerable Rom. Catholic element, the Church hierarchy deemed it necessary to maintain its own schools, because in the public schools no religious instruction was given. This position was reinforced in the years following 1848, when there was a heavy migration of Ger. and Irish Catholics to the U.S.A. To-day

practically every Catholic par. has its own school maintained, not out of public funds like the public schools, but from the resources of the Church itself. In the large towns the schools are housed in as fine and up-to-date buildings as any in their section. The Rom. Catholics in 1956 maintained 9000 parochial and other elementary schools with 3,545,000 pupils, 2532 secondary schools with 672,000 pupils.

**Parody** (Gk *parōidia*, from *para*, beside, and *ōidē*, a song), writing, either in prose or verse, in which an author's style is copied and his sentiment mimicked in order to ridicule the original; or in which what is written on one subject is altered and applied to another by way of burlesque. The art is almost as old as literature, since wherever a writer of talent is found, there is also found a parodist. The *Batrachomyomachia* (Battle of Frogs and Mice), which was ascribed to Homer, is among the earliest known P.s. The merciless caricature of Euripides' style presented in Aristophanes, particularly in the *Frogs*, has never been surpassed for subtlety and humour. P. in Rom. literature occupied a subordinate place to satire, in which it sometimes appeared. P.s of the extravagances of the time are found in Shakespeare, who was himself parodied by Marston. Dryden was very well parodied by Buckingham in his *Rehearsal*, 1672, whilst *The Splendid Shilling*, by J. Phillips, although somewhat over-rated, set the fashion of employing the sonorous rhythm of Milton for ludicrous subjects. A good collection of P.s of the 18th cent. was contained in *A Pipe of Tobacco*, 1736, in which J. H. Browne mimicked with very good effect Colley Cibber, Ambrose Phillips, J. Thomson, E. Young, and J. Swift; the *Anti-Jacobin*, 1797, of J. H. Frore also contains some good P.s. In the following cent. the *Rejected Addresses*, 1818, of J. and H. Smith contained some exceedingly clever imitations of Wordsworth, Byron, Crabbe, Scott, Southey, Moore, and others; moreover, their P.s were marked by no such bitterness and animosity as was Shelley's *Peter Bell the Third*, a P. of Wordsworth. The *Bon Gaultier Ballads*, 1855, of Sir T. Martin and Aytoun, and A. C. Hilton's magazine, *The Light Green*, 1872, contain good specimens of P.s. But the palm in this period must be awarded to C. S. Calverley, who, in *Verses and Translations*, 1862, and *Fly Leaves*, 1872, reached greater heights than any other Eng. parodist; his work is marked by such almost uncanny cleverness of craftsmanship that not only the turns of phrase, but the very turns of thought of his victims seem to have been appropriated. In the last part of the cent. the *Heptalogia, or Seven against Sense*, 1880, which was supposed to have been written by Swinburne, Andrew Lang's *Ban and Arrière Ban*, and the *Green Bays*, 1893, of 'Q' (Sir A. Quiller-Couch), are worthy of mention; and Owen Seaman, the editor of *Punch*, proved himself in the *Battle of the Bays*, 1896, and *Borrowed Plumes*, 1902, to be an excellent parodist. P. has also been

used effectively in the present cent. by T. S. Eliot and W. H. Auden.

In its commonest form, verbal imitation, P. demands no great ingenuity, and it is because that form is so easy that the whole art of P. has fallen into disrepute. A poem like Calverley's *Pedlar*, which parodies Lord Tennyson's *The Brook*, 1887, is excusable on the plea that it reproduces the spirit and style of Tennyson. Another good example of this form of P. is A. C. Hilton's *Heathen Pass-ee*, which parodies Bret Harte's *Heathen Chinee*, 1877. The verbal imitation form of P., however, ridicules style rather than matter. In its highest form P. aims at the literary merits in some isolated example of the works parodied. It burlesques the salient eccentricities rather than the essential characteristics. As regards prose, *Don Quixote*, 1605, parodies most excellently the medieval romance, and some of Thackeray's works, such as *Codlingsby*, are very fair P.s. The *Condensed Novels*, 1867, of Bret Harte are among the best examples of prose P.s, though some good work has been done in this direction by Barry Pain, Max Beerbohm, F. C. Burnand, and Sir Owen Seaman. Of both prose and verse P. Sir J. C. Squire is a master. P. and burlesque are very closely related (for examples of the latter art see **BURLESQUE**). See W. Hamilton, *Parodies of the Works of English and American Authors* (6 vols. 1884-9; C. Wells, *A Parody Anthology*, 1904; W. Jerrold and R. M. Leonard, *A Century of Parody and Imitation*, 1913; C. R. Stone, *Parody*, 1915; J. C. Squire, *Apes and Parrots*, 1928; and G. Kitchen, *A Survey of Burlesque and Parody in English*, 1931.

**Parol Altercation**, see **PLEADINGS**.

**Parole** (Fr. from late Lat. *paravola*, Gk *parabolē*, story), word formerly in use as the equivalent of verbal or oral, but in this sense now employed only in the legal phrase P. evidence as distinguished from written evidence. In its more common sense it is an abbreviation of the Fr. phrase *parole d'honneur*, or word of honour. This is a military term, denoting a prisoner's promise that he will not attempt to escape, and that if released he will not again take up arms in the war in which he has taken part. It is a rule of international law that prisoners of war may be set at liberty on P. only if the laws of their country authorise it, and that in such case they are bound on their personal honour scrupulously to fulfil the engagements they have contracted, and their own gov. may not require or accept from them any service contrary to the P. given. A prisoner of war cannot be forced to accept his liberty on P.; similarly the hostile gov. is not obliged to assent to the prisoner's request to be set at liberty on P. The punishment for breach of P. is death. (Hague Conference rules, 1907—articles 10 and 11.) The term is also used as an equivalent for password, or used only by officers or inspectors of guard.

**Paronomasia** (Gk *para*, beside; *onoma*, word), or play upon words, is the placing together of words of similar sound, as in

'Might is right,' 'Not Angles but angels.' It is often used as equivalent to pun (q.v.). See also FIGURE OF SPEECH.

**Paros**, is. of the Grecian archipelago, Cyclades group, in the Aegean Sea, 4½ m. W. of Naxos. It is in shape a low pyramid, consisting largely of one huge mt of marble (Mt St Elias, formerly Mt Marpessa, 2530 ft). Parian marble was very famous in ant times for sculptural purposes, and is still used, the existing quarries being about 4 m. to the E. of the cap., Paroekia, or P. (pop. 2500). The bay of Naussa, on the N., affords excellent anchorage. The prin. products of the is. are marble, wine, fruit, and potatoes. P. was first colonised by the Ionian Greeks, and was conquered by the Persians in 490 BC. During the 5th cent. BC it became a member of the Athenian confederacy. Area 75 sq. m. Pop. 9000.

**Parotid Gland**, one of the salivary glands. It is situated in front of and below the external ear; its duct (Stensen's duct) is about 2 in. long and opens on the buccal surface of the cheek opposite the second upper molar tooth. The gland secretes saliva containing ptyalin, potassium, sulphocyanide, traces of urea, mineral salts, etc. See also MUMPS.

**Parousia**, The, see ADVENT.

**Paroxysmal Haemoglobinuria**, see BLACKWATER FEVER.



CATHERINE PARR

**Parr**, Catherine (1512-48), Queen of England, sixth wife of Henry VIII, b. Kendal, Westmorland, daughter of Sir Thomas Parr. She had already been widowed twice before she married Henry in 1543. C. had been well educated, and was Protestant in her religious views. She treated Henry's children with real affection. After the death of Henry, she contracted a marriage—of affection on her part and self-interest on his—with Thomas Seymour, Lord-Admiral of England (brother of Jane Seymour), who

neglected and ill-treated her. She d. after giving birth to his daughter.

**Parr**, Samuel (1747-1825), pedagogue and author, b. Harrow-on-the-Hill, son of an apothecary. He was educ. at Cambridge, becoming an assistant master at Harrow and headmaster successively at Colchester and Norwich schools. Having taken holy orders, he finally (1785) settled at Hatton, Warwickshire, where he took private pupils. He interested himself in political affairs and became prominent as a pamphleteer. P. was a great Latinist, but left no work to account for the great reputation for ability which he enjoyed in his lifetime. His chief power lay in his conversation, but though he was nicknamed 'the Whig Johnson,' he fell far short of his model. His writings, including correspondence, were pub. in 1828. See W. Field, *Memoirs of the Life, Writings, and Opinions of Samuel Parr*, 1828; E. H. Barker, *Parriana*, 1828; and P. Colson, *Private Portraits*, 1948.

**Parr**, Thomas (c. 1483-1635), 'Old P.', was a native of Albury, near Shrewsbury. He is said to have lived to the age of 152, and his longevity has been celebrated by Taylor the 'Water-poet.'

**Parr**, William, see NORTHAMPTON, MARQUESS OF.

**Parr**, see SALMON.

**Parra**, see JACANA.

**Parrakeet**, see PARAKEET.

**Parral**, see HIDALGO DE PARRAL.

**Parramatta**, suburb of Sydney (q.v.), New S. Wales, Australia, on the P. R., 14 m. W. of Sydney, after which it was the oldest tn in the colony. It is now mainly a residential and industrial area. Pop. 78,880.

**Parratt**, Sir Walter (1841-1924), organist, b. Huddersfield, son of the par. organist, and educ. privately. From 1854 to 1861 he was organist at St Paul's Church in his native tn, and in 1872 at Magdalen College, Oxford. He became organist at St George's Chapel, Windsor, in 1882, holding office until his death. In 1892 he was knighted and made Master of the King's Music. He was also prof. of music at Oxford, 1908-18, and from 1916 to 1920 dean of the faculty of music in London Univ. P. composed music for the production of *Agamemnon* at Oxford, 1880, as well as for the *Tale of Troy* and *The Story of Orestes*, and also odes, anthems, songs, and organ pieces, as well as various compositions on the occasion of royal weddings and other state ceremonies. He had much influence upon the development of organ playing in England. See life by D. F. Tovey and G. Parratt, 1941.

**Parrhasius** (Parrasios) (fl. 400 BC), famous Gk painter, was the contemporary and rival of Zeuxis. He was a native of Ephesus, but spent most of his time in Athens, and is ranked among the greatest Attic artists; indeed, he is said to have done for painting what Phidias did for sculpture. His picture of the Athenian Demos is famous, and his study of Theseus adorned the Capitol in Rome.

**Parricide** (Lat. *parricidium*, from *pater*, father, and *caedere*, to kill), crime of

murdering a parent or a near relation. In Rom. times the law against P. was very severe, special punishments being reserved for those who were found guilty. In some countries there may be a tendency even to-day to treat anyone guilty of P. with greater severity than other murderers, but the Eng. law makes no distinction.

**Parrish, Anne** (1888-1957), Amer. novelist, b. Colorado Springs. She studied art in Philadelphia, afterwards travelling a great deal. In 1915 she married Charles A. Corliss, who died in 1936, and in 1938 Josiah Titzell, poet and novelist. Best-known of her novels is *The Perennial Bachelor*, which won the Harper Prize in 1925. Others are *A Pocketful of Poses*, 1923, *Semi-Attached*, 1924, *To-morrow Morning*, 1926, *All Kneeling*, 1928, *The Methodist Fawn*, 1929, *Loads of Love*, 1932, *Sea Level*, 1934, *Golden Wedding*, 1936, *Mr Despondency's Daughter*, 1938, *Pray for a To-morrow*, 1941, *Poor Child*, 1945, and *A Clouded Star*, 1948.

**Parrot**, species of the family Psittacidae, most abundant in the warmer parts of Australia and S. America, though numerous in other tropical countries. They include a number of widely divergent forms and details of organisation. The plumage is often gorgeously coloured, but a few are soberly tinted. Most of them are arboreal in habit, but the owl P. or kapo of New Zealand is flightless and lives usually on the ground, though it can still climb trees. Another New Zealand P. differs from the rest of the group in having developed carnivorous habits. The characteristic large and powerful, much-arched bill, with its elongated tip, is well adapted in most P.s for tearing up fruit and cracking nuts, and in a number of species the tongue is highly specialised for extracting honey by means of a brush-like tip. Many species are favourite cage-birds. The best talker is the African grey P. (*Psittacus erithacus*), a bird of from 10 to 12 in. long; with the exception of the short, broad tail, which is bright scarlet, the plumage is pearl-grey in colour. The sexes are hard to distinguish, and as males are rarely imported, it is almost unknown for it to breed in captivity. Many Amazons are imported; one of the best talkers is the brilliantly coloured blue-fronted Amazon. A P. is taught to talk by repeating words slowly and distinctly over and over again, preferably from a place of concealment. Variety of food is necessary, and should include fruit, but little or no meat, if cuttlefish bone is excepted. Water for drinking is required in spite of a popular idea to the contrary, and many P.s like bathing water. Grit in the form of clean gravel is also essential for digestive pro-

See E. F. Daglish, *The Pet Keepers' Manual*, 1958.

**Parrot Fishes**, or **Parrot Wrasses** (Scaridae), group of fish in which the teeth of the jaw have coalesced to form extremely hard beaks which are able to bite off pieces of coral; these, as well as seaweed and molluscs, form the prin. food. They are all brilliantly coloured, and some

attain a length of 4 ft. *Scarus cridenis*, a Mediterranean species, was much esteemed by the ancients.

**Parrotia**, genus of 2 small deciduous trees, family Hamamelidaceae, of the Himalaya and Persia; *P. jacquemontiana* and *P. persica* are valued in gardens for their ornamental foliage, especially in autumn.

**Parry, Caleb Hillier** (1755-1822), physician, b. Cirencester, Gloucestershire. After studying medicine at Edinburgh, where he qualified M.D. in 1778, he settled in practice at Bath. In 1787 he bought a farm and became one of the best scientific agriculturists. He was for many years physician to Bath General Hospital. He gave the first clear account of exophthalmic goitre (sometimes called 'Parry's disease'), describing 8 cases, the first in 1786. He was the first to record facial hemiatrophy. Both these contributions to medicine are recorded in *Collections from the Unpublished Medical Writings of C. H. Parry*, 1825. He also gave one of the earliest accounts of angina pectoris (1788). See W. Macmichael, *Lives of British Physicians*, 1830.

**Parry, Sir Edward Abbot** (1863-1943), judge and author, b. London. Co. court judge at Manchester, 1894-1911, then at Lambeth, retiring in 1927; president of the Pensions Appeal Tribunal, 1917-18. His plays include *Kalawampus* (children's play, in collaboration with Louis Calvert, 1895, produced in 1901); *England's Elizabeth* (with Calvert, 1901); *What the Butler Saw* (with Frederick Mouillot, 1905). Other pubs.: *Letters from Dorothy Osborne to Sir William Temple*, 1887, 1902; *Pater's Book of Rhymes*, 1901; *What the Judge Saw*, 1912, and *What the Judge Thought*, 1922, both reminiscences; *The Law and the Poor*, 1914, intended to promote certain legal reforms; *The Law and the Woman*, 1916; *The Drama and the Law*, 1924; *The Overbury Mystery*, 1925; *The Gospel and the Law*, 1928; *Berrington*, 1929, a novel; *The Bloody Assize*, 1929; *My Own Way: an Autobiography*, 1932. P. will be remembered longer as an author than as a lawyer, although he did excellent work in his profession.

**Parry, Sir Hubert** (1848-1918), composer, b. Bournemouth. Educ. at Eton and Oxford, after leaving the univ. he studied music under Sterndale Bennett and Macfarren. He was appointed prof. of composition and musical hist. at the Royal College of Music, 1883, and director, on the death of Sir George Grove, in 1894. The 5 scenes from *Prometheus Unbound* attracted much attention in 1880, and his mastery of choral work appears in *Blest Pair of Sirens*; but his early promise was not wholly fulfilled. Spontaneity and a sense of constructive purpose are often lacking, though they appear in his best works. He excelled in the setting of Eng. works. His literary works include *Studies of Great Composers*, 1877; *The Art of Music*, 1893; and *Style in Musical Art*, 1900, 1911. Among his other compositions are music to *The Birds* and *The Frogs* of Aristophanes; music to the *Agamemnon* of Aeschylus; *Judith*; *King*

*Saul; Te Deum; Invocation to Music; A Song of Darkness and Light; The Vision of Life; and Jerusalem* (a setting of the poem prefacing Blake's *Milton*). See R. A. Streatfeild, *Hubert Parry, 1913*, and C. L. Graves, *Hubert Parry: His Life and Works, 1926*.

**Parry, Sir William Edward** (1790-1855), sailor and explorer, b. Bath. P. commanded expeditions to the Arctic in 1819-20, 1821-3, 1824-5, and 1827; the first 3 voyages being attempts to discover the NW. Passage, and the fourth, from Spitsbergen, to reach the N. Pole, when he reached lat. 82° 45' N. The charts he made of the N. seas were very valuable to navigation. He was voted a sum of money by Parliament for reaching long. 110° W. in lat. 74° 44', and was made hydrographer to the Admiralty, and later rear-adm. The accounts of his voyages form an interesting chapter in the hist. of arctic exploration. It was owing to his skill and resource that the passages of Lancaster Sound and Barrow Strait, Prince Regent Inlet, and Wellington Channel were discovered. A memoir was pub. by his son, Edward P., in 1857.

**Parry Islands**, group in the Arctic Ocean belonging to Canada, W. of Baffin Bay and N. of Lancaster Sound, Melville Sound, and Barrow Strait. The P. I. include Bathurst, Melville, Cornwallis, and Prince Patrick Is., are covered with tundra, and are uninhabited. Sir W. E. Parry, after whom they are named, visited them in 1819, and the expeditions searching for Franklin explored them further.

**Parry Sound**, tn of Ontario, Canada, 221 m. W. of Ottawa, on Georgian Bay (Lake Huron), with lumbering industry. Pop. 5350.

**Parsec**, unit of astronomical distance for objects outside the solar system: the distance of a star of parallax (q.v.) one second of arc, i.e. 31 light-years, or 19 million million miles, generally expressed in the form  $19 \times 10^{14}$  m. See METROLOGY.

**Parsees (Parsis)**, the last survivors of the old Iranian race. When the Arabs conquered Persia in the 7th cent., the P. fled to India rather than give up their ant. Zoroastrian religion, consisting of fire-worship, belief in metaphysical dualism, and the practice of good thought, word, and deed. The P. are mostly in Bombay, and number barely 100,000 all told. For over 1300 years they have kept intact their individuality and sturdy independence of habit and customs, and a mode of living which is more W. than E. They are an enterprising race, foremost in the trade, commerce, and industries of India. They were the first to open cotton mills, iron and steel works, and research institutions in India, and from them came the naval architects who a hundred years ago built ships-of-the-line for the R.N.

The Indian political freedom movement was started by them, and 3 members of the Brit. House of Commons have been P. They were the first to teach non-communalism to Indians by sinking wells and building schools, hospitals, and

caravanserais which were open to all without distinction of caste, colour, or creed.

There is not an uneducated man or woman among them, and their charitable trusts and institutions are such that no Parsee need go without food, clothes, or shelter if he is unable to provide these for himself. Purity being the basic principle of their religion, they keep themselves and their homes scrupulously clean and tidy. Altogether they are among the most enlightened and progressive of the races and nationalities of India.

**Parsley** (*Petroselinum crispum*), biennial flavouring and garnishing herb. It will grow in almost any soil, but does best in a deep rich moist loam. A single sowing of seed is made in April, and from the seedlings, if kept thin, a supply of plants can be secured for 2 seasons. P. makes a handsome edging to beds.

**Parsnip** (*Peucedanum sativum*), native Brit. umbelliferous biennial, long valued for its edible tap-roots. It is hardy and easily grown in deeply dug soil, which need not be rich. The seed, which must be new, should be sown in March, and the seedlings thinned out until the plants are set apart. The roots are ready for use in Oct., but until required may be left in the ground, where their flavour improves.

**Parson** (Lat. *persona*; *parson* and *person* are the same word, the *person* being so called because 'by his *person* the Church, which is an invisible body, is represented'—Blackstone): 1. Priest of a par. or eccles. corporation. During his life a P. has the freehold in himself of the parsonage house, the glebe, the tithes, and other dues. Strictly the rector in holy orders is a P., while the vicar is not.

2. In common usage any ordained clergyman, and also nonconformist ministers and preachers.

**Parsons, Sir Charles Algernon** (1854-1931), inventor and engineer, son of the third earl of Rosse, b. in London, was educated privately and at St John's College, Cambridge. He is best known in connection with the steam-turbine which bears his name, and which he rendered suitable for the generation of electricity and the propulsion of vessels. The first turbine was produced in 1884; the torpedo boat *Turbina* was the first to be fitted with turbine engines. He was made a fellow of the Royal Society in 1898. Other inventions of his are an improved variety of gramophone and a non-skid device for motor tyres. K.C.B. 1911, O.M. 1927. He received the Copley medal of the Royal Society in 1928. He wrote on the turbine and other engineering matters. In 1926 pub. *The Scientific Papers of William Parsons, third Earl of Rosse*. See life by R. Appleyard, 1933, and R. H. Parsons, *The Steam Turbine*, 1946.

**Parsons, or Persons, Robert** (1546-1610), Jesuit and polemical writer, b. Nether Stowey, Somerset, and educ. at Oxford. In 1574 he resigned his fellowship at Balliol, entering the Society of Jesus at Rome in 1575, and being ordained priest 3 years later. He and



Campion (q.v.) were selected for the work of the Eng. mission, directed chiefly from Douai, and he landed at Dover in 1580; but Campion was arrested and P. had to flee the country. He went back to Rome, whence he continued to direct the Eng. mission, and later went to Spain, where he founded a number of institutions for training Eng. priests. He was a man of great attainments and amazing industry, but is best remembered for his inveterate political intrigues. He played a considerable part in the policy which eventually led to the dispatch of the Sp. Armada for the invasion of Britain. His great aim was working for foreign intervention on behalf of Eng. Catholics. Among his best-known controversial pamphlets is the *Brief Discourse concerning certain reasons why Catholics refuse to go to Church*.

Parsons, William, see ROSSE, EARL OF.

Parsonstown, see BIRR.

Parthenay, Fr. tn, cap. of an arron., in the dept of Deux-Sèvres, on the Thouet. It has interesting old buildings and anct ramparts. There are cloth industries, and fences are manuf. Pop. 7900.

Parthenius, Barān-su, or Bartine, riv. of Anatolia, Asiatic Turkey, the tn of Barān, on its banks, being on the site of the anct vil. of Parthenia. It was the chief riv. of W. Paphlagonia, and formed part of the boundary between Paphlagonia and Bithynia. It rises on Mt Olgasys and flows NW. into the Euxine (Black Sea), 10 m. from Anastasis.

Parthenocissus, family Vitaceae, genus of deciduous climbers with twining or adhesively tipped tendrils, closely akin to Annelopsis and Vitis. *P. quinquefolia*, Eastern N. America, is the True Virginia Creeper, though the term is also applied to *P. vitacea*. *P. henryana*, *P. thomsonii*, and *P. tricuspidata* are choice Chinese species, hardy on walls, and beautiful in autumn colour.

Parthenogenesis, see BIOLOGY; FERTILISATION; ALTERNATION OF GENERATIONS.

Parthenon (from Gk *parthenos*, a virgin), most celebrated Doric temple of anct Greece, and one of the finest pieces of architecture in the world, receives its name from its dedication to the virgin goddess Athena. It was commenced in 447 BC and finished in 432 BC. Its architects were Ictinus and Callicrates, but the whole of the work was carried out under the supervision of the sculptor Phidias, by whom the statue of Athena Parthenos, which stood in the *naos*, was executed. The temple is situated on the S. side of the Acropolis at Athens. It is octastyle (with 8 columns in front) and pseudo-dipteral (with only one range of columns at the side). The number of columns along the flank is 17, counting those at the corners. Behind the corners of the peristyle are 6 columns, somewhat smaller in size. The most notable feature in the architecture of the P. is the delicacy of the refinements introduced to counteract various optical illusions. These are to be found everywhere, in the curves of the columns, stylobate, cornice, etc.

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Often they are so slight as to be revealed only on the most careful measurement. The chief dimensions are as follows (outside measurements): length, 228 ft; width, 101 ft; height, 64 ft; length of *naos*, 98 ft; width of *naos*, 63 ft. The fine sculptures of the metopes, frieze, etc., were mostly removed to the Brit. Museum by Lord Elgin in 1801-16. The worst of the injuries which the P. has suffered from war and pillage was inflicted in the siege of Athens by the Venetians in 1687, when a shell exploded in a powder-magazine in the centre, and demolished much of the side walls. Some slight damage, chiefly in the shape of scars and splintering, was caused by shell and mortar fire during the Second World War, and from rifle fire in the succeeding disturbances. There is an immense literature on the P. See the official *Guide to the Department of Greek and Roman Antiquities in the British Museum*, which contains plans of the building. The sculptures are dealt with in H. B. Walters's *The Art of the Greeks* (chap. vi, 31st ed.), 1934. See also ARCHITECTURE, 2.

Parthenope, see NAPLES.

Parthenopean Republic, formed in Naples (q.v.) under the direction of the Fr., in Jan. 1799. Naples, once called Parthenope, was recaptured for the Bourbon house by Cardinal Ruffo, the Fr. leaving their protégés to their fate. Nelson then arrived, and, ignoring the armistice concluded between the two sides, sanctioned the execution of sev. republican leaders, including Francesco Caraccioli (q.v.).

Parthia, anct name of a country of W. Asia, situated to the SE. of the Caspian Sea, and corresponding to the N. portion of the Persian prov. of Khorassan. The country was primarily subject to Persia, and later to the Seleucidae. But in 250 BC the satrap Pherecles was slain, and Arsaces, leader of the Parnians, a subdivision of the Dahae, was proclaimed first King of P.; such is the official account, but in all probability Pherecles was satrap of Pstaeue, to the NW. of P. The empire thus started grew in importance, until after the time of its greatest power, under Mithridates I and II, it extended to the Euphrates, Caspian Sea, Indus, and Indian Ocean. From the 1st cent. BC onwards P. waged many wars with Rome, and was at one time her ally and at another her vassal. The Parthian cavalry were very famous, and from their method of shooting as they appeared to retreat comes the expression a 'Parthian shot.' In AD 226 the country was annexed to the new kingdom of Persia, founded by Artaxerxes. The cap. of the Parthian Empire was Ctesiphon (q.v.), of which some remains exist. Their language is sometimes called Pehlevi. The Lat. poets of the Augustan age use the names Parthi, Persae, and Medi indifferently. See N. C. Debevoise, *A Political History of Parthia*, 1938.

Parties to a Crime, see CRIMINAL LAW.

Parting, in metallurgy, the separation of gold from silver by heating with concentrated nitric acid, in which the silver

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dissolves while the gold remains unaffected. This process is now obsolete.

**Partinico**, tn in Sicily (q.v.), 15 m. SW. of Palermo (q.v.). It is an agric. centre, has textile manufs., and is known for its wine. Pop. 23,400.

**Partisans**, see GUERRILLAS.

**Partition**, in equity (q.v.), the div. of a joint estate in land into separate parts. P. may be effected either by a deed, by agreement between the joint tenants, by order of the Ministry of Agriculture, or by a P. action in the chancery div.; but in the last case the court must, under the Partition Act, 1868, direct a sale instead of P. if tenants to the extent of one-half require it. See also JOINT TENANCY; COMMON, TENANCY IN.

**Partition Coefficient**. When a substance is shaken up with 2 immiscible liquids, in both of which it dissolves, it distributes itself between the 2 liquids in such a way that the ratio of its concentration in them is a constant, called the P. C. of the substance in these solvents.

**Partnership**. In Eng. law a P. is the relation which subsists between 2 or more persons carrying on a business in common with a view to profit. It is essential to an understanding of the Eng. law of P., the fundamental principles of which are to be found in the consolidating Partnership Act, 1890, to distinguish P.s from companies and corporations, notwithstanding that the law of unincorporated companies consists of 'little else than the law of partnership modified and adapted to the wants of a large fluctuating number of members' (Lindley). And the same is true of companies which are incorporated (see COMPANY). In short, though registered joint-stock companies are P.s, they are P.s of an exceptional nature, and are expressly excluded from the provisions of the Partnership Act, 1890. The prin. differences between companies and P.s proper are these: (1) A P. is not a distinct entity from the persons composing it, and hence the personal liability of partners for the P. debts is unlimited, although recourse must first be had by the creditors to the P. assets; but the liability of a joint-stock company is generally limited either to the amount unpaid on the shares or by guarantee, and when its assets are exhausted nothing further remains for the creditors. (2) A registered company (other than a private company) may consist of any number of members not less than 7; but a P. may not contain more than 20, or, in the case of a banking P., 10 members. A 'private company' with limited liability and containing as few as 2 members is now, however, perfectly lawful (see on this at the end of the article on COMPANY; and also COMMANDITE, SOCIÉTÉ EN). (3) The formation and continuance of a P. depend on the mutual confidence in and personal relationship of the different members to each other, but such a relationship between the shareholders of a company is virtually non-existent. (4) Every partner is entitled, subject to the terms of the P. agreement, to participate in the business; but in the case of companies the manage-

ment is delegated to directors, who, in most cases, are in that position mainly by their own appointment, regardless of the wishes of the shareholders. It is not always easy to determine whether a particular transaction constitutes a P. or not; and, in particular, agreements to lend money to a P. must be carefully drawn to avoid the inference that the lender was really a partner. The Act of 1890 is notoriously cryptic on the subject, especially in regard to the inference to be drawn from a profit-sharing agreement. The general effect, according to high opinion, is that sharing profits without more implies a P.; but if there are other facts these, too, must be taken into consideration; e.g. if A lent money to B in return for a share of accruing profits, but in no way interfered in or controlled B's business, and had no power to prevent the misuse of the assets, A would probably not be held to be in P. with B. A *bona fide* loan will not constitute the lender a partner with the borrower; but it must be a loan with a personal liability on the part of the borrower to repay, and the lender must not take an interest in or share of the capital *in specie*, because that of itself would imply a joint interest in or part ownership (i.e. P.) of the capital and profits. In other words, lending on the security of a share in a P. is one thing; contribution towards a joint speculation in return for a proportionate share of profits quite another, and generally conclusive evidence of a P. The Act also provides that the following facts, *inter alia*, do not, taken by themselves, constitute P.: (1) The receipt by a servant of a share of profits by way of remuneration, or by a widow or child of a deceased partner of a portion of the profits by way of annuity. (2) The receipt of a portion of profits by the vendor of the goodwill of the business. (3) The receipt of a debt out of accruing profits.

A written agreement is not essential to the formation of a valid P., and indeed a P. may be inferred from a general course of dealing. But in practice deeds are usually drawn up, and it would be highly imprudent not to guard oneself by some document. Writing, however, is required in the case of a P. which is either intended to last for more than one year or is only to commence at a future date exceeding a year ahead (see CONTRACT; FRAUDS, STATUTE OF), subject to the effect of part performance. The matters that common prudence demands the settlement of in the agreement are these: (1) The nature of the business. (2) The duration of the P. (3) The firm name. (4) Mode of providing the capital. (5) Banking account and signing of cheques. (6) Management. (7) Accounts. (8) Expenses and profits. (9) Effect of the death of a partner or the dissolution of the firm for any other reason. (10) Provision for the family of a deceased partner. (11) Arbitration. A firm may lawfully carry on business under any name or style, whether those of the partners themselves or not, provided, if they adopt other than their own names, the result is not calculated to deceive the

customers of other persons already trading in such name and thereby to deprive another business of profits that would otherwise have accrued to it. It is a moot point whether partners can lawfully carry on a business in their own names if those names are already well known to the public as the style of an existing firm; and all that can be said with certainty is that if the new firm is deliberately trying to pass off its goods as those of the old firm, or represent its business to be the same, the latter can get an injunction against the former.

Certain P.s are unlawful: those against public policy or *contra bonos mores*, e.g. a P. in the profits of a gambling-hell or a bawdy-house; those the membership of which is in excess of the statutory numbers; medical or solicitor P.s where some of the partners are not properly qualified to practise. A bookmaking P. is not *per se* illegal, but if it was intended to carry it on at a 'place' within the meaning of the Betting Act, 1853, it would be illegal (*see GAMING*). The prin. legal effect of a P. being unlawful is that the court will not recognise actions by any of the partners against any of their fellow partners. All the partners in any firm are agents for each other, and each can bind the firm to the extent of his apparent or ostensible authority. Limitations of authority as a rule cannot affect third persons unless they had notice of such limitations, but only give the firm a remedy against the individual partner or partners who have exceeded those *de facto* limitations. To be within the apparent authority of a partner the act: (a) must be done in relation to the P. business; (b) must be incidental to the usual business of the firm: e.g. where the business is not of a commercial nature, or where there is no buying or selling of goods, a partner cannot issue negotiable instruments or borrow or pledge the firm property, though he can sign ordinary cheques; the firm would only be liable for an act outside the scope of its business if the partner who did it had express authority to do it; and (c) must be done in the character, not of an individual, but of a partner, or in the firm name or in some other manner indicative of an intention to bind the firm.

Every partner is liable for the P. debts, and the creditor can sue any or all of them; and if he obtains judgment against the firm he may issue execution (q.v.) against the private property of the members if the P. assets prove insufficient. If he chooses to sue one or more partners separately, and obtains judgment, he cannot enforce that judgment against the partners he chose not to sue, nor can he sue such other partners by reason of not obtaining satisfaction against those he did sue. When a partner retires an agreement by the continuing partners to release him from existing firm liabilities will not release him as against those creditors who do not assent to the arrangement. A new partner is only liable by special agreement for debts incurred by the firm before he became a member. Generally

only partners can be responsible for firm liabilities; but if any person by his conduct 'holds himself out' as a partner, he will not be allowed afterwards to deny a role upon the assumption of which outside people may have been induced to give credit to the firm. It is only upon the principle of 'holding out' that a retiring partner can be made liable for debts contracted after his retirement, i.e. if he allows himself to appear to remain a member. To escape future liability he should give express notice of his retirement to habitual customers of the firm, and by a general notice in the *London Gazette*. Only actual members of a firm are liable for the torts (i.e. wrongs independent of contract) of a partner; the doctrine of holding out does not apply to torts, and even an actual member cannot be held responsible for the fraud or other tort of a fellow member of a firm unless the act (a) was within the ordinary course of the firm's business, or done with the other partners' authority; or (b) consisted of a misapplication of funds or other property received by the misapplying partner within the scope of his ostensible authority (or received in the first instance by the firm) and misapplied whilst in the custody of the firm. The ordinary rights of a partner *inter se* are generally regulated by agreement. Unless modified by agreement the following rights are implied: (1) to take part in the business; (2) to have the business carried on according to the terms of the P. agreement; (3) to be indemnified by the firm against personal liabilities incurred by him in the ordinary course of the firm's business; (4) to be paid interest at 5 per cent on advances by him to the firm beyond the capital he has originally agreed to subscribe; (5) to prevent new partners being admitted against his wishes; (6) to have the firm's books kept at the prin. place of business; (7) to share equally in the capital and profits; and (8) to enjoy the confidence of his co-partners.

A P. may come to an end: (1) at the will of any partner where no fixed term has been agreed on; or (2) by fluxion of the term agreed upon if any; or (3) upon the performance of the venture for the accomplishment of which the P. was formed; or (4) by bankruptcy or death of a partner (unless otherwise agreed upon in the P. deed or agreement); or (5) by the desire of the other partners if one member suffers his share of the assets to become charged for his private debts; or (6) by the fraud of one partner on his co-partners; or (7) by the occurrence of some event causing the P. to become unlawful; or (8) by the decree of the court upon the application of one or more of the partners (a) where some partner has become insane, or permanently incapable, or been guilty of such conduct as makes it impracticable for the others to continue in P. with him; (b) when the business can only be carried on at a loss; and (c) whenever the court thinks it 'just and equitable' to order a dissolution.

*Limited Partnerships.* The Limited Partnerships Act, 1907, provides for limited P.s of not more than 10 persons in

the case of banking or more than 20 in other cases who are 'general partners' and who are liable for all debts and obligations of the firm, and of one or more 'limited partners,' who will not be liable for the firm's debts or obligations beyond the amount they have contributed to the P. capital. A limited partner may not take part in the management of the P. business, and he has no power to bind the firm. But he may, personally or through his agent, at any time inspect the books of the firm and examine the state and prospects of the business, and may consult with the other partners in such matters. If he takes part in the management of the business he will be liable for all debts and obligations incurred while he so takes part in the management. Any differences arising as to ordinary matters connected with the business may be decided by a majority of the general partners. A limited partner may with the consent of the general partners assign his share in the P. A limited partner cannot dissolve the P. by notice. See Sir A. Underhill, *Principles of the Law of Partnership* (6th ed. by G. Hesketh), 1950; N. Lindley, *Law of Partnership, including Limited Partnerships* (11th ed.), 1951; and Sir F. Pollock, *The Law of Partnership* (15th ed. by L. C. B. Gower), 1952.

Partridge, Eric Honeywood (1894- ), New Zealand lexicographer, b. Gisborne, New Zealand. Educ. at Queensland Univ., from 1910 to 1913 he was a schoolmaster, then during the First World War served as a private in the Australian infantry. From 1921 to 1923 he held a Queensland Travelling Fellowship and studied at Oxford, and from then till 1927 was a lecturer in English. His most important work was his great *Dictionary of Slang and Unconventional English*, 1937, which was twice revised. A large work on similar lines is his *Dictionary of the Underworld*, 1950. He also pub. a *Dictionary of Cliches*, 1940; a *Dictionary of Abbreviations*, 1942; *Usage and Abuse*, 1947, a guide to good English; *Name into Word*, 1949, a dictionary of proper names that have become common nouns; and *You Have a Point There*, 1953, a guide to punctuation. After the Second World War, in which he served with the Royal Air Force, he collaborated in a *Dictionary of Forces Slang*, 1948. He also pub. *British and American English Since 1900*, and many smaller books on language.

Partridge, John (1644-1715), astrologer, b. E. Sheen, Surrey. He pub. a number of pamphlets and books dealing with astrology, and issued an almanac entitled *Merlinus Liberatus* (1670). He also wrote *Astrological Vade Mecum* (1679), *Flagitiosus Mercurius Flagellatus* (1697); and a trans. of Mynsicht's *Treasury of Physic*. His almanac was ridiculed by Swift.

Partridge. Two P.s are common in Britain, but it is usually the grey P. (*Perdix perdix*) that is associated with the name. The other is the Fr. or red-legged P. (*Alectoris rufa*), which was introduced into Britain towards the end of the 18th cent. by the Marquess of

Hertford. Its sides and flanks are transversely barred, and its flight is more rapid than that of the grey P. In this species the plumage is mainly brown; the breast is bluish-grey, freckled with brown, and with a horseshoe patch of chestnut on a white ground on the lower breast. The sides are barred with chestnut. The wings are rounded and short. P.s pair very early in the year, the males, like the males of most gallinaceous species, being very pugnacious. The nest is made with a minimum of trouble on the ground in fields or hedges, and contains from 10 to 16 pale greenish-yellow eggs. The hen hatches them, but the male is attentive to her during incubation. The young are fed chiefly on ant pupae, and other insects when these are not available; these and snails and slugs form a considerable proportion of the food of older birds, but in addition grain and other seeds are consumed in great quantity when obtainable. The young remain with their parents for some months, forming coveys of about 20 birds. In the morning and evening they search the stubble and pastures for food, but during the day they hide wherever safe cover may be found. The season for partridge shooting is from 1 Sept. to 1 Feb. See B. Vesey-Fitzgerald, *British Game*, 1948.

Partridge Wood, or Cabbage Wood, is derived from *Andira inermis*, a leguminous evergreen tree, native of S. America.

Parts of Speech, in grammar, are usually reckoned as being 8 in number. This number was fixed by the Greeks, and though the classification has been changed since their time, the number has remained permanent. Aristotle, in his philosophical works, speaks of 3 parts of speech, nouns (*onomata*), predicates (*rhēmata*), and connectives (*sundesmoi*). The later Gk writers fixed the parts of speech as follows: noun, verb, participle, article, pronoun, preposition, adverb, conjunction. The adjective was included under the noun, and here also came certain pronouns and numerals. When the Romans took over this system of classification an alteration was necessary, for the Lat. language contained no article. For this class the interjection was substituted. The Romans also abolished the participle class, but kept the number at 8 by giving the adjective a class by itself. The Rom. classification is that now generally adopted. It must not be supposed, however, that either of these arrangements is entirely satisfactory. They are both somewhat arbitrary, and the boundaries that separate one class from the other are very narrow. Words are now almost invariably assigned to their classes according to the function that they perform, and this simplifies matters when once a satisfactory definition of each part of speech has been obtained. According to this method a large number of words can each serve at different times as different P. of S. The use of words as nouns which are really adjectives is very common, while the participle, though formally a verb, is more frequently used as an adjective than

as a verb. Similarly the verbal noun partakes of the nature of a noun. Adjectives and adverbs have always been more or less interchangeable. The interjection has no function in the sentence, and so should not, strictly speaking, be included in the list. It is the conventionalised form of those early and semi-inarticulate sounds with which primitive man eked out his gesture language. The other parts of speech were all primarily derived from the verb and the noun. See GRAMMAR, and articles on each of the separate P. of S.

**Party Government (Party System).** Gov. by party in one form or another exists in most civilised countries, and political parties are a corollary of any democracy where the electorate is large.

The Eng. dual party system was evolved from the historical accident of the div. into Whigs and Tories in the Stuart period, a div. which had become stereotyped into a tradition that it corresponded to a real divergence of political outlook—the Tories being the representatives of monarchy, Anglicanism, and insularism, the Whigs the aristocratic party of foreign adventure and expansion. By the mid-19th cent. the 2 great parties had approached near to each other, and, in Gladstone's words, the only distinction was that one 'was rather more stationary, the other more movable.' His own great contribution was to convert the old Whigs into the Liberal party, which held the gov. of England in alternation with that Conservative party which was largely Disraeli's refashioning of the old Tories. Eng. P. G. is a contradiction of the constitutional theory of gov. by king, lords, and commons. In the earliest decades of the 20th cent. the Liberal party appeared to be pledged to schemes of social reform and retrenchment, while the Conservative party seemed to be bent on the preservation of vested interests and some scheme of tariff reform. There are 2 main political parties in England, the Labour party having replaced the Liberal party as the natural opponents of the Conservatives. (A detailed statement of the growth and policy of the Labour party will be found under LABOUR PARTY.) However, political re-alignment is a standing possibility.

The struggle between Commons and Crown was theoretically decided in 1688. The chief development of the 18th and 19th cents. was the evolution of Cabinet gov. based upon party majorities.

The Eng. party system is eminently favoured by the fact that the ministry of the day has gradually succeeded in drawing virtually the whole of the legislative as well as the executive power into its hands. It differs from the group systems of P. G. in vogue before the Second World War on the Continent in that in the latter there were always, or nearly always, present in the legislative assembly one or more groups of 'irreconcilables,' whose immediate object was to change the existing form of gov., sometimes by peaceful, sometimes by violent, means, in the same manner that the Communist party, whilst participating in the Eng. parl.

system, ultimately seeks a totalitarian rule.

In recent times there has been a tendency to refer to royal commissions of experts outside the House of Commons questions which require ability not found in politics. In times of grave crisis P. G. has been abandoned in favour of coalition. See CONSTITUTION; GOVERNMENT; PARLIAMENT; POLITICAL PARTIES; REPRESENTATION. See R. T. McKenzie, *British Political Parties*, 1955; and J. F. S. Ross, *Elections and Electors*, 1955.

**United States.** Here the party system has evolved some distinctive features. Beyond influencing public opinion, directing gov. policy, and winning elections, the Amer. party organisations select candidates for office and procure positions for party workers. (Party patronage existed in 18th-cent. England, but was replaced by a politically neutral civil service.)

The party system originated during the discussions over the federal constitution (1787-91). The Federalist party, led by Alexander Hamilton and John Adams, maintained the supremacy of the central gov. and the subordination to it of the states. The Antifederalist party, which soon became known as Republican or Democratic-Republican, was led by Thomas Jefferson; it stood for the independence of the states in legislation, administration, and jurisdiction. The Federalist party declined in influence and disappeared between 1820 and 1830; it was replaced by the National Republican and, later, the Whig party. The Democratic-Republicans under Andrew Jackson came to be known as Democrats. About 1854 the Whig party fell out over slavery, and 2 years later a new Republican party was formed, supporting most of the Whig traditions. Since that time the Republicans and the Democrats have alternated in power. There have been many smaller parties, including Populist, Socialist, Prohibitionist, and Progressive.

The Democratic party, under President Jackson, was the first to establish elaborate party machinery. The machinery of an Amer. party consists of 2 bodies, one permanent and the other temporary. The first body includes a national committee and various geographically subordinate committees, such as state, co., and congressional dist. Each committee is locally independent, and is concerned with the management of party affairs, the organisation of meetings, and superintendence of the poll. The temporary machinery of the party consists of the periodical conventions (or equivalent meetings) of party delegates in the different election areas for making party nominations to elective posts. A few months before every presidential election a national convention is held, to which the state conventions send 2 delegates (with alternatives) for each congressman or U.S. senator, plus 'bonus' delegates depending on state victory in the preceding election. Delegates from states with presidential primary elections are 'instructed' to support initially the successful candidate in the state election; other delegates may be

instructed by their state convention, or may be uninstructed. The first business of the national convention is organisation, with appointment of a temporary and a permanent chairman and of various committees, including one on platform and resolutions. The temporary chairman delivers the 'keynote' address and then yields the gavel to the permanent chairman. Meanwhile the platform committee holds hearings and proceeds to write the party platform, which it submits to the pleasure of the convention. When the platform has been adopted the alphabetical roll of the states is called, and, in turn, they name their candidates for the party nomination for president. As soon as this is completed the roll is called again for the delegate vote, by states, on the candidates named. The process is repeated until one candidate receives a majority vote. The party nominee for vice-president is then chosen in the same way.

The Republican party (q.v.) has tended to strengthen the central gov.; the Democratic party (q.v.) to uphold the rights of the states. Notwithstanding this tradition, the Democratic administration of Franklin Roosevelt probably interfered more with states' rights than any other administration in Amer. hist. The Democrats include many conservatives; the Republicans some of the boldest advocates of social economic experiment. Although the largest single block of opinion in the Democratic party is the conservative one in the S.—still predominantly Democratic in spite of some upsets—it is the party more consistently opposed to big business and finance. It has powerful city organisations, of which Tammany Hall in New York is best known. It has won the support of many liberals and of a large part of organised labour, in the absence of a national Labour party. Farmers, except in the S., have normally voted Republican; but at times they have swung *en masse* to the Democratic side. The Republican party, whose greatest strength has long been in the E. and the middle and far W., is primarily conservative and has favoured industry. See C. E. Merriam and H. F. Gosnell, *The American Party System*, 1929; T. W. Cousins, *Politics and Political Organisations in America*, 1942.

'Single-party Government.' The antithesis to the party system as understood in England or the U.S.A. or any of the Brit. dominions, or to the group system of France, etc., is the single-party form of gov. of Fascist, Communist, or 'authoritarian' regimes. 'Single-party government' is a misnomer or even a contradiction in terms, for a coherent party system implies the existence and political influence of more than one party. The essential feature of any authoritarian system is that it is 'nationalist' in character and intolerant of political opposition. See FASCISM; NATIONAL SOCIALISM; RUSSIA.

Paruta, Paolo (1540-98), Venetian historian. He was appointed official historian to the republic. His *History of*

*the War of Cyprus*, and *History of Venice from 1513 to 1551*, were pub. after his death.

Parvati, or Uma, consort of Siva (q.v.). Parvise (from Lat. *paradisus*, enclosed garden), an enclosed space in front of a church, as formerly at St Paul's Cathedral, London. (A room over a church-porch should not be called a P.)

Pasadena, city of California, in Los Angeles co., 10 m. NNE. of Los Angeles. In the foothills of the San Gabriel Mts, it has an altitude of from 750 to 1000 ft, and has sev. mt peaks in the immediate vicinity ranging from 3200 to 6000 ft, with 2 observatories. Its fine climate and picturesque surroundings make it a famous winter health resort, its vicinity to Los Angeles making it a favourite residence of cinema artists. Fruits and flowers and subtropical trees and plants grow and bloom all the year round. P. grows fruit for export, particularly oranges and lemons. Cork-oak grows, also eucalyptus, and pepper-growing is an important industry. P. manufs. furniture and precision instruments, and has machine shops. It is the seat of the Calif. Inst. of Technology, P. College, P. City College, the John Muir College, and other institutions. It holds an annual Tournament of Roses. Pop. 104,577.

Pasajes, see SAN SEBASTIÁN.

Pasang, see AEGAGRIE.

Pasargadae, anct city of Persia. Cyrus the Great made it his cap. and built a number of palaces and temples there. The cap. was transferred to Persepolis (q.v.) by Darius. P. was situated near the R. Polvar, about 55 m. NE. of Shiraz. The prin. ruins include the tomb of Cyrus. See also PERSIAN ART.

Pascagoula, riv. of U.S.A., in the SE. portion of Mississippi. It flows for a course of about 250 m. into a small bay of the same name, on the Gulf of Mexico, and is navigable for about 100 m.

Pascal, Blaise (1623-62), Fr. mathematician and devotional author, b. of a good family of lawyers at Clermont-Ferrand. As a mathematician, his youthful achievements of discovering by himself *Euclid*, Book I up to Proposition 32, at the age of 12, and of writing a book on conic sections (which gained the approval of Descartes, and which is the foundation of the modern treatment of the subject), at the age of 16, gave promise of extraordinary ability. This promise was amply fulfilled; by following up the experiments of Torricelli, he succeeded in determining the weight of air, and from this he arrived at the means of measuring altitude by reading barometric pressure. He invented the hydrostatic press, and also a calculating machine; and in pure mathematics he investigated the theory of probability and the differential calculus. P. embraced a monastic life in 1654, and came under Jansenist influence at Port Royal. In the same year he enjoyed the famous mystical experience referred to in the wonderful prayer known as the *Memoir*. The following year Antoine Arnauld, the virtual chief of the circle, being threatened with censure by

the Sorbonne for his teaching on efficacious grace, called upon P. to defend him. The result was his celebrated *Lettres provinciales* (1656-7), regarded by Voltaire as 'witty as Molière and sublime as Bossuet.' The following year his health broke down, and he died 4 years later. His *Pensées sur la religion* were pub. in 1669; they were ostensibly the jottings for a projected *Apologia*. P. recognised that Christianity is a bond between the greatest and the most degraded, as symbolised particularly at the Crucifixion; he refuted the sceptic and modified the Stoic



BLAISE PASCAL

position accordingly, in his own brilliant style. This may account for the dictum that 'he juggled with God and with the immortality of the soul'; and this in turn for his condemnation by some critics (e.g. Cousin) as a pessimist. Nietzsche called P. 'the one logical Christian.' The Eulogium of P. by Bordas-Demoulin, which won the prize of the Fr. Academy on 30 June 1842 is to be found in many eds. of the *Lettres*. The best ed. of the *Pensées* is that of Lafuma, 1955. There is a trans. from L. Brunschvicg's edition by W. F. Trotter in Everyman's Library. Fagnere's ed. of the *Lettres provinciales* is the most reliable. P.'s complete works were ed. by L. Brunschvicg and E. Boutroux in 1908. See L. Brunschvicg, *La Génie de Pascal*, 1924; C. J. Webb, *Pascal's Philosophy of Religion*, 1929; M. Bishop, *Pascal*, 1938; H. F. Stewart, *The Secret of Pascal*, 1941; and D. Patrick, *Pascal and Kierkegaard*, 1948.

**Pasch**, Gk for Passover and Easter (q.v.). **Paschal**, name of 2 popes and 1 anti-pope: (1) *Paschal I* (817-24), a Roman, notable chiefly for his relations with the Emperors Louis and Lothar, the latter of whom he crowned in 823. In his pontificate the iconoclastic controversy began. He was canonised. (2) *Paschal II*, known also as *Rainerius* (1099-1118), reigned while the question of investiture was being disputed, and thus came into conflict with Henry I of England among others. (3) *Paschal III* (Guido of Crema),

antipope, was set up in 1164 by Frederick Barbarossa, and continued the opposition to Alexander III. At the instigation of Frederick he canonised Charlemagne.

**Pasco**, Cerro de, see CERRO DE PASCO. **Pascoli**, Giovanni (1855-1912), It. poet and scholar, b. San Mauro di Romagna (Rimini). In 1905 he succeeded Carducci in the chair of It. literature at Bologna Univ. His first collection of verse, *Myricae*, was pub. in 1891, mostly poems of simple country life. In 1897 followed *Primi Poemetti*, and *Canti di Castelvecchio* in 1903. His *Poemi conviviali* (1904) are more classical in inspiration, and deal with eternal themes. The *Poemi italiani* (1911) are patriotic poems, evoking events of Italy's past. He also wrote excellent poetry in Latin, and trans. Shelley, Tennyson, and Wordsworth. P. departs from the tradition in his use of profuse images, his deliberate symbolism, his unusual rhythms, and his large vocabulary. His influence on younger poets was immense. See *Pascoli*, *Poems*, trans. A. M. Abbot, 1927; A. Galetti, *La poesia e l'arte di G. Pascoli*, 1924; A. Pompeati, *Pascoli*, 1939; A. Zamboni, *Pascoli*, 1941.

**Pas-de-Calais**: 1. Or Strait of Dover (see DOVER).

2. Dept of the N. of France, formed of most of the anc. prov. of Artois, and the maritime portion of Picardy. It has a coast-line on the Strait of Dover (q.v.). The surface is generally flat and well watered. The prin. agric. products are cereals, potatoes, sugar-beet, and tobacco, and livestock breeding is important. There is a rich coalfield, and textile, metallurgical, sugar, and other manufs. The coastal areas have fishing and tourist industries. The dept was the scene of severe fighting in both World Wars, and many parts of it suffered greatly. In 1944 the Germans launched flying bombs (q.v.) from sites in the dept. The prin. towns are Arras (the cap.), Béthune, Boulogne-sur-Mer, Montreuil, St-Omer, Calais, Lens (qq.v.). Area 2606 sq. m. Pop. 1,276,800.

**Paseng**, see GOAT.

**Pasha**, **Pacha**, or **Bashaw**, title derived from the Persian, and applied to commanders of high rank, naval, military, or civil, in the Turkish Empire. At one time it was limited to princes of the blood. Every general or governor of a prov. was *ex officio* a P.

**Pashto**, see PUSHTU.

**Pasig**: 1. Riv. of Luzon, Philippine Is. It flows W. from the N. end of the Laguna Bay, emptying into Manila Bay at Manila.

2. Cap. of Rizal prov., Luzon, Philippine Is., on Pasig R. 7 m. E. of Manila. Pop. 35,407.

**Pasiphaë**, daughter of Helios and Persis, wife of Minos. A nymphomaniac, she concealed herself in a wooden cow made for her by Daedalus, and became mother of the Minotaur (q.v.).

**Paso del Norte**, El, see CIUDAD JUÁREZ. **Pasque Flower** (*Pulsatilla vulgaris*), beautiful Brit. plant so called because of its purple flowers which appear about

Easter time. It is a good rockery plant, but prefers a dry, chalky soil.

**Pasquier, Etienne** (1629-1615), Fr. advocate and writer, b. Paris. Early destined by his parents to follow the career of an advocate, he studied law at the Bologna Univ. under Socin, and was admitted to the Bar in 1549. During his earlier days he indulged his literary tastes by publishing *Recherches sur la France* (in encyclopaedia form), 1560; *Monophile* (dissertations on love), 1555; and his forceful *Exhortation aux princes*, 1561, advocating freedom of conscience. The first named led to his obtaining in the *Parlement* in 1564 a brief for the univ. of Paris, the law-suit arising out of the Jesuits' attempt to gain admission to that univ. Thenceforth he appeared in numerous causes célèbres. In 1588 he became deputy in the States-General (q.v.). In 1603 he resigned his office of advocate to the king, and devoted the rest of his life to literature. The collected works of P. were pub. in 1723. See Margaret J. Moore, *E. Pasquier, historien de la poésie et de la langue française*, 1934. See also his delightful *Letiers*, pub. in 3 vols., 1619.

**Pasquin, or Pasquino**, name of a cobbler of Rome, celebrated for the gibes he hurled at every turn. He lived at the corner of the Palazzo Orsini, and at his death the mutilated statue of a gladiator, which was found under the pavement near his stall, was put up on the same spot and received the name P. It became customary to affix to this statue satirical verses directed against prominent personages, which were hence called *pasquinades*. The satires were for the most part epigrammatic replies to some topical question affixed on the pediment of a statue of Marforio, which stood near by. A celebrated instance is the following:

*Marforio.* E vero, Pasquino, che tutti Francesi sono ladri?

*Pasquino.* Tutti, no, ma buona parte.

('Is it true, Pasquin, that all Frenchmen are thieves?')

'All! no, but the greater part of them.')

directed against and being a pun upon the name of Napoleon Bonaparte, on the occasion of the Fr. occupation of Rome.

**Passacaglia** (Sp. *pasar*, walk, and *calle*, street), originally a Sp. dance, but now an instrumental composition based on a ground, i.e. a tune continuing throughout, usually, but not necessarily, in the bass, as it always does in the Chaconne (q.v.). The best-known example actually called P. is Bach's for organ; there is a famous P. for harpsichord by Couperin, and the finales of Brahms's Fourth and of Vaughan-Williams's Fifth Symphonies are other familiar Ps.

**Passage**, Court of, anct. existing civil court of record in the bor. of Liverpool. Formerly the mayor acted as presiding judge, assisted by bailiffs of the bor.; but by the Court of Passage Act, 1834, a qualified legal assessor was added to the bench, and 4 years later the mayor and bailiffs were dispensed with altogether. Finally, an Act of 1893 made the assessor the sole presiding judge, with powers not

inferior to those of a high court judge. Generally speaking, only those actions can be tried in this court where the defendant at the time the action was launched resided or carried on business within the jurisdiction, or, by leave of the judge or registrar, where the whole or part of the cause of action arose within the jurisdiction.

**Passage Island**, see CULEBRA.

**Passage West**, tn and shipping centre in Cork harbour, Rep. of Ireland. The upper Cork harbour begins here with depths of 52 ft at low water. Pop. 2660.

**Passaic**: 1. City of New Jersey, U.S.A., 13 m. NW. of New York. The E. part consists chiefly of a plain, whilst the W. is more hilly and almost entirely residential. The chief buildings of interest are the city hall, general hospital, general public library, and the Jane Watson Reid Memorial Library. The prin. manufs. are rubber goods, metal wares, silk, cottons, worsted, radio and telegraph equipment, railroad cars, brakes, chemicals, paper products, and biscuits. Pop. 57,702.

2. Riv. of New Jersey, U.S.A., rising in Morris co., and flowing between Union and Essex cos. for a course of about 80 m. into Newark Bay. The falls at Paterson (70 ft) supply abundant water-power for the tns of Newark, Paterson, and P.

**Passamaquoddy**, tribe of N. Amer. Indians of Algonquin stock, allied to the Penobscots. The remnant of them reside on the W. shore of Passamaquoddy Bay, in the state of Maine, and number over 600.

**Passamaquoddy Bay**, inlet of the Atlantic between Maine, U.S.A., and New Brunswick, Canada. It is 30 m. in length and about 20 m. in breadth at the entrance, and is deep, sheltered, and never blocked by ice. P. project was begun in 1935 in the U.S. part of the bay to salvage heavy tides (18 ft) for hydro-electric power, but it was abandoned. Proposals have been made to revive the project under U.S.-Canadian sponsorship.

**Passaro, Cape**, Battle of, battle fought between the Eng. and Sp. fleets in 1718. The Spanish had captured the is. of Sicily, and were besieging Messina. The Brit. fleet, under Adm. Byng, raised the siege and compelled the Spaniards to withdraw from Sicily.

**Passarowitz**, see POZAREVAC.

**Passau**, Ger. tn in the Land of Bavaria (q.v.), 92 m. ENE. of Munich (q.v.). It is on the Austrian border, at the confluence of the Danube, the Inn (q.v.), and the Ilz. It was by origin a Celtic settlement, and later a Rom. camp. In 739 St Boniface (q.v.) made it a bishopric; the bishop became a prince of the Empire in the 13th cent., and P. developed into a riv. port of great importance. On the suppression of the bishopric in 1803 the tn became a Bavarian possession (the present bishopric was estab. in 1817). P. is a beautiful tn, standing on wooded heights and possessing a wealth of curious streets and anct. mansions. It is dominated by its massive baroque and Gothic cathedral (14th-17th cents.) and by a great fortress, begun in the 13th cent. It



has brewing, paper, tobacco, and engineering industries. Pop. 35,000. See F. Mader, *Passau*, 1925.

**Passchendaele**, tn in Flanders, near Ypres. The tn and P. ridge, the high ground in front of Ypres, were the scene of bitter fighting in the third battle of Ypres on 12 Oct. and 26 Oct. to 10 Nov. 1917. The ridge was the immediate objective of the allies' offensive from Ypres after the Messines-Wytschaete ridge had been taken by the Brit. troops of Eng. and Irish and dominion units. The Ger. defences were strengthened with 'pill-boxes' or concrete redoubts bristling with machine-guns, and, being level with the ground, difficult to reduce by artillery fire and fatal to attacking infantry. The Brit. forces, after heavy losses, entered P. itself on 30 Oct., but were driven out again almost immediately. The Canadians retook the tn on 8 Nov. and held their positions in face of desperate Ger. counter-attacks, and throughout the next days the allies successfully cleared the sides of the ridge; its surrender in the battle of P. (or the Lys) in April 1918 was a sore blow to Brit. pride. The tn was eventually recaptured at the end of Sept. 1918. Eng. military critics have severely criticised the Fr. and Brit. high commands for the whole conception and strategy of this costly and tragic battle of the days of static trench warfare.

**Passenger Pigeon** (*Ectopistes* (or *Columba*) *migratoria*), N. Amer. bird whose sudden and complete disappearance is the most remarkable in zoological hist. It was probably the most gregarious bird in existence, and during its breeding season used to occupy a crowded area of over 100 sq. m. On account of its value as a table delicacy it was ruthlessly persecuted, and in one year 15,000,000 dead birds were dispatched from Michigan and Pennsylvania. In 1888 it failed to take up its usual breeding quarters, and then disappeared without trace, the last known specimen dying in 1914 at Cincinnati zoological gardens. Its main features were its long wings and longer narrow tail.

**Passenger Rail Services**, see RAILWAYS. **Passeriformes**, order of perching or passerine birds, characterised especially by the 4-toed foot, the claw of the hind toe, which is separately controlled, being larger than that of any of the other toes. This is by far the largest order of birds, consisting of 5000 to 6000 species—about half the number of known birds. Only among its numbers is the power of song much developed. There is, however, a section of the order which includes a number of songless birds, none of which are found in Europe.

**Passfield, Lady**, see WEBB, BEATRICE. **Passfield**, Sidney James Webb, Baron (1859-1947), socialist, historian, and statesman; b. London, son of Charles Webb. He was educ. at private schools in London and spent some years in Switzerland and Germany, completing his education at the City of London College, Birkbeck College, and King's College. He was a clerk in a colonial broker's office in London, 1875-8; by open competition

he reached the status of lower div. clerk in the War Office, 1878-9; he was surveyor of taxes, 1879-81; colonial office clerk, 1881-91. In 1885 he was called to the Bar, and gained the LL.B. of London Univ. He was member for Deptford on the L.C.C., 1892-1910. Prof. of public administration, London School of Economics, 1912-27; and one of the senate of London Univ., 1900-9; he served on the Royal Commission on Trade Union Law, 1903-6; the Coal Industries Commission, 1910; the Royal Commission under Development Act, 1910-22; and many important committees. Labour M.P. for the Seaham div. of Durham co. 1922-9, he was P.C. in 1924, being president of the Board of Trade from Jan. to Nov. of that year. In 1929 he was ennobled and became secretary of state for the colonies and dominion affairs (from 1930 to 1931 for colonies only). His greatest achievement is the placing of the Brit. socialist movement in its historical setting by the books he wrote in collaboration with his wife, Beatrice Webb (q.v.). Although he held Cabinet rank in 2 Labour Govs. he was never a prominent figure in public life, and when he entered the House of Commons in 1922 his career had begun to draw towards its close. It was indeed with reluctance that he accepted the office of president of the board of trade in 1924, and he had already contemplated retirement when, as a peer, he once more assumed office in the dominions and colonial offices. Yet in practical achievement he accomplished more than most politicians of his day as in the development of social and political reform. Through the Fabian Society, of which he was one of the pioneers (see under FABIAN SOCIETY), he played the most conspicuous part in converting Brit. Socialism from a propaganda of social revolution to a programme for the working-class movement, and more than any other led the Labour party to accept the Fabian interpretation of Socialism. But his greatest interest was education, and, having become chairman of the Technical Education Board, he strove to bring secondary and univ. education within reach of the working classes (he lectured in political economy at the City of London College and Working Men's College); and he was so far successful that the subsequent revolution in educational administration, the transfer of control to local authorities, the development of secondary education, and the enlargement of the univ. system were all for the most part due to his efforts. The Fabian programme, much of which the Education Act of 1902 embodied, was also his work. He was entitled to particular credit for his share in the creation of the Imperial College of Science and Technology, and the development of a unified library system in London.

The Webbs formed a partnership unique in the public life of their generation, and one to which the socialist movement must be ever grateful. One of their striking achievements was a visit to Russia in 1932 and 1934, which resulted in *Soviet Communism: a New Civilisation?*,

1935, which work, however, proved the least acceptable of the Webbs' writings, critics condemning its too ready acceptance of gov. statistics and its failure sufficiently to consider the loss of individual liberty in the Soviet system. This, however, in no way lessens the magnitude and importance of the work, both in affairs and in writing, which this long partnership performed. The ashes of Lord and Lady P. (d. 1943) were interred in Westminster Abbey in Dec. 1947. The great mass of pubs. by Lord P. include, with his wife, *History of Trade Unionism*, 1894, revised 1920; *Industrial Democracy*, 1897; and a series of vols. on the hist. of local government (*English Local Government*, 1908-22); also his *Socialism in England*, 1890; *A Constitution for the Socialist Commonwealth of Great Britain*, 1920; *English Poor Law History*, 1927-9; and *Soviet Communism*, 1935. See the autobiographies of Lady P., *My Apprenticeship*, 1926, and *Our Partnership*, 1948; also Margaret Cole (ed.), *The Webbs and their Work*, 1949.

**Passion Flower**, family *Passifloraceae*, genus of climbing herbs and shrubs, many of which bear flowers of a form which led devout settlers in S. America to give the plants their name. The 3 stigmas were seen to represent nails, one transfixing each hand, and one the feet, of the crucified Christ; the rays of the corona, the crown of thorns; the 5 anthers, the wounds; the 10 parts of the perianth, the 10 faithful apostles; and the digitate leaves and tendrils, the hands and scourges of those who scourged Him. *P. caerulea* is hardy in warm, sheltered gardens, but the other species require culture under glass. *P. edulis* is the Granadilla, grown for its fruit. The genus also includes plants formerly classed under *Tecsonia*.

**Passion Music**. From the earliest days of the Christian Church it has been the custom to read the hist. of the Passion of Christ during Holy Week, but it is impossible to say at what date the hist. began to be solemnly chanted, though it was certainly before the 8th cent. In the Rom. Church the Passion gospels are sung in plainchant by 3 priests in 3 different tones, one taking the words of our Lord, another the words of the evangelist, and a third those of other characters. The people (*turba*) are, when possible, represented by the choir, for whom magnificent polyphonic music was written by Palestrina and Victoria. The same elements are retained by the Ger. Passion, from Schütz to Bach; in the latter's P.s the evangelist (tenor) relates the story in recitative, Christ (bass) sings short sentences in *arioso* style, the *turba* is by turns reflective and dramatic (i.e. a commenting chorus or an actual crowd), and arias are interspersed, the text of which is not taken from the Gospels but is a contemporary poet's reflection on them.

**Passion Play**, drama in the form of the old miracle plays depicting the Passion of our Lord. P. P.s are found during the later Middle Ages, especially in Germany

and the Tyrol, and they reached the height of their excellence during the 16th cent. The best-known modern example is the Oberammergau P. P., first mentioned in 1633 in connection with a vow made by the peasants, after a severe visitation of the plague, that they would perform a passion drama once in every 10 years. The text of the Oberammergau play has sev. times undergone revision. See F. W. Farrar, *Passion Play at Oberammergau*, 1890, and the *Official Guide to Oberammergau*, 1950. See also MIRACLE PLAY.

**Passion-tide**, the last 2 weeks before Easter.

**Passionists**. 'The Congregation of Discalced Clerks of the Most Holy Cross and Passion of our Lord Jesus Christ' was founded by St Paul of the Cross about 1730, its rule being approved in 1741 by Benedict XIV. They are engaged in revival and mission work in various parts of the world. The P. were introduced into England in 1841.

**Passive Resistance**. This term, which figured largely in the newspapers shortly after the passing of the Education Act, 1902, was the name given to the movement, whether organised or not, for the refusal to pay the new education rate. By this Act voluntary elementary schools became rate-aided for the first time in the hist. of the great education controversy, and the rate in aid, which was levied as part of the co., bor., or dist. rate (as the case might be), was vehemently objected to by nonconformist (mainly) ratepayers, on the ground that by compelling them to maintain church schools the legislature was guilty of endowing a particular religious denomination and one with which they had no sympathy. In India, between the two world wars, Gandhi (q.v.) embarked upon a campaign of opposition to what he conceived to be Brit. injustice and oppression, which was characterised by professedly non-violent tactics known as 'P.R.', as well as 'civil disobedience' and 'non-co-operation'. In industrial disputes the principle of P.R. is exemplified in dilatory tactics, variously known as 'going slow,' 'ca' canny,' and 'working to rule.'

**Passivity**, state induced in certain metals whereby they become insoluble in dilute acids. P. is caused by dipping the metal (e.g. iron, chromium) in concentrated nitric acid. It can be removed by rubbing with sandpaper, etc.

**Passmore Edwards**, see EDWARDS.

**Passoeroean**, see PASURUAN.

**Passos**, John (Roderigo), see DOS PASSOS.

**Passover**, (Heb. *pesah*), first of the 3 great festivals commanded to be observed in the Pentateuchal codes. According to Exodus xii, it was instituted to commemorate the *exodus* from Egypt, in particular the 'passing over' of the houses of the Israelites (distinguished by the sprinkled blood on the door-posts) by the angel of the Lord when the first-born of the Egyptians were slain. The order of its celebration was to be thus: A lamb or kid, a male of the first year, without

blemish, was selected by each household (or, if the households were small, by 2 conjointly on the tenth day of the month Abib (Nisan), and it was kept till the fourteenth day of the month, when it was killed and roasted and eaten with unleavened bread and bitter herbs. . . . for thou earnest forth out of the land of Egypt in haste . . . (Deut. xvi. 3.) They were, therefore, to eat it in haste, standing, with their loins girded, their shoes on their feet, and their staves in their hands, as those prepared for a journey. None, whether Israelites or strangers, were to partake of it unless they had been circumcised. During the 7 days for which the feast lasted none but unleavened bread, called *Mazoth*, was to be eaten, on penalty of being cut off from the people, and special sacrifices were appointed for each of these days. The first and the last of these 7 days were considered as full feasts and 'no manner of work shall be done in them, save that which every man must eat' (Exod. xii. 16). Outside Palestine the P. lasts 8 days, of which the first 2 and the last 2 are full feasts. The paschal lamb is still sacrificed by the Samaritans on Mt Gerizim.

**Passport**, warrant of protection and authority to travel. P.s may be obtained from the P. Dept. of the Foreign Office and through the local offices of the Ministry of Labour. U.K. P.s are now primarily issued to persons who are citizens of the U.K. and Colonies, that is, persons who were born or naturalised in the U.K. or Colonies as constituted on 1 Jan. 1949, or whose fathers were born in such a ter. Persons who were born or naturalised in a Commonwealth country should apply for P. facilities to the High Commissioner of that country. Since 1 Jan. 1949 an alien woman does not automatically acquire her husband's Brit. nationality upon marriage, neither does a Brit. woman lose her Brit. nationality upon marriage to an alien. Foreign P.s are available for 5 years from the date of issue, and may be renewed for further consecutive periods up to 5 years, but in no case beyond 10 years from the date of original issue. The address of the P. Office is Clive House, Petty France, London, S.W.1, and there are branch offices in Liverpool and Glasgow and an agency in Belfast to which personal application may be made. U.K. passports are normally endorsed for all foreign countries.

**Passy**: 1. Dist. of W. Paris, beside the Bois de Boulogne (q.v.). It is a residential area, and has associations with many names famous in history and art—Lamartine, Rossini, J.-J. Rousseau, Masséna, and Balzac (qq.v.), amongst others. There are numerous clinics and convalescent homes.

2. Fr. com. in the dept of Haute-Savoie. It is a tourist centre. Pop. 6800.

**Paste**, form of adhesive usually made by mixing flour with water (about 2 lb. to the gallon). The water is added gradually and the whole well mixed. An ounce of alum is added to

increase the adhesiveness, and the whole boiled and well stirred. Bookbinders usually add about an ounce and a half of resin instead of the alum, thus getting a thicker and still more tenacious P. See ADHESIVES; GLUE.

**Pasteboard**, see CARDBOARD.

**Pastel**, or **Crayon**, **Drawing**, name applied to a method of painting with dry pigments. The use of coloured chalks has a long history, and many European old masters used them to heighten the effect of a drawing. Crayon 'painting' was practised in England from an early date, and John Riley (1646-91) produced many works in P., but Francis Cotes (1725-70) was the first Englishman to develop the art fully, and his portraits of Mr and Mrs Joab Bates and Lord Hawke testify to his high ability. He was followed by John Russell, R.A. (1765-1806), who brought the art to perfection. But it came to be a favourite medium not only in England (especially for portraiture), but also on the Continent in the course of the 18th cent., such names as Rosalba Carriera, J. E. Liotard and the great master Quentin de la Tour being conspicuous. Chardin used the medium in rivalry with him. In more modern times it has been practised by Degas, Toulouse-Lautrec, Millet, and Whistler. Some of Degas' most beautiful ballet scenes and nude studies were executed in pastel. Its revival in the latter half of the 19th cent. was due to a renewed appreciation of the swift and free handling it allowed and the fresh and luminous effects it could produce.

See J. L. Sprink, *A Guide to Pastel Painting* (Rowney).

**Pasternak**, Boris Leonidovich (1890- ), the most outstanding contemporary Russian poet, of Jewish origin. He studied music and philosophy at Moscow and Marburg. As a young man he joined the Futurist literary movement. He wrote lyrical (*A Twin in Clouds*, 1914, *Over the Barriers*, 1917, *My Sister Life*, 1922, *Themes and Variations*, 1923, *The Second Birth*, 1932, *On Early Trains*, 1943, *The Terrestrial Expanse*, 1945), autobiographical (*Spektrskiy*, 1926), and historical (*Lieutenant Schmidt*, 1926, *The Year 1905*, 1927) poems, and some prose works (remembrances, *The Safe Conduct*, 1931). From the late 1920's P. led the life of an 'internal émigré'. Unable to publish original works he often turned to translation (brilliant translations of Shakespeare's tragedies; Goethe's *Faust*, Petőfi, and Georgian poets). His novel, *Dr Zhivago*, pub. abroad 1957, is a masterpiece and an effective condemnation of the Bolshevik revolution as a spiritual reaction. At present he is widely considered the leader of the intellectual opposition.

**Pasteur**, Louis (1822-95), Fr. chemist and bacteriologist, b. Dôle (Jura), the son of a tanner. He was educ. at Artois, Besançon, the École Normale, and the Sorbonne. B.-es.-L. 1840, and became a mathematics master; B.-es.-Sc. 1842. He studied chemistry and physics, and worked specially on isomeric compounds.

In 1852 he was appointed prof. of chemistry at Strasburg, where he married Mlle Laurent. Earlier he made a classical investigation of tartaric acid and discovered that tartaric acid crystals showed faces that were inclined to the right, while the crystals of *para*-tartaric acid showed faces inclined sometimes to the right and sometimes to the left. Separating the two types, he proved that the 'right-faced' crystals rotated polarised light to the right and 'left-handed' crystals rotated the light to the left, a mixture of the two being inactive. For this work he was awarded the Rumford



Hachette

LOUIS PASTEUR

Medal of the Royal Society (1856). In Strasburg his attention was turned to fermentation, and he showed that *Pentecillium glaucum* destroyed only the right-handed portion of the inactive tartaric acid. He was appointed prof. of chemistry at Lille in 1854. In the breweries of this he examined the 'diseases' of beer, wine, and vinegar, and discovered the micro-organism of fermentation, thus killing the old theory of 'spontaneous generation' by proving the presence of bacteria in the atmosphere and the healthiness of injured living matter when protected from them. These researches led directly to Lister's epochal work on antiseptics, having proved the germ theory of disease. Meanwhile his work on acetous, lactic, and vinous fermentations was pub. (1876) in *Études sur la bière*, with great advantage to an important industry in his native country. His recommendation of heat treatment of beer led to *pasteurisation* (q.v.). This was not his only service directly to industry. In 1865 he carried out a masterly and classical research on the disease attacking the silkworm, discovered that there were in fact 2 diseases caused by

different microparasites, and showed how they could be prevented (*Étude sur les maladies des vers à soie*, 1870). In the midst of this work P. suffered a cerebral haemorrhage and never entirely recovered from the consequent paralysis. He next turned to the study of chicken cholera and, by investigating the causal virus, demonstrated the principle of preventive inoculation; by attenuating (weakening) the virus and then inoculating it a mild attack of the disease was produced in the subject, who thereafter became immune. A similar result followed his work on anthrax (1881), the bacillus of which had already been discovered. In 1880 P. began experiments on rabies (hydrophobia) which were to lead to the most startling discovery of his career. Although he did not succeed in isolating the virus, he located it in the central nervous system and was able to produce a vaccine of attenuated virus. On 16 July 1885 he inoculated Joseph Meister, an Alsatian boy who had been bitten by a rabid dog; the child did not develop rabies. A great wave of enthusiasm and generosity following this discovery led to the foundation of the Pasteur Institute in Paris, where P. was able to carry on his work and train others; this is now one of the most important of its type in the world; other P. institutes have since been founded. Outside the institute in Paris stands a statue of P. inoculating Joseph Meister, who later became its concierge and d. by his own hand during the occupation of France in 1940.

Numerous other discoveries are accredited to P., whose name is one of the greatest in medicine. His many writings appeared in collected form (*Œuvres de Pasteur*, 7 vols., 1922-39). The best *Life*, by R. Valléry-Radot, appeared in Eng. trans. 1930; see also Eleanor Dooly, *The Microbe Man*, 1938; R. J. Dubos, *Louis Pasteur, Free Lance of Science*, 1951; and *Life* by E. M. Attwood, 1954. See also DAIRY (for pasteurisation); PASTEUR TREATMENT.

**Pasteur Treatment**, name given to Louis Pasteur's (q.v.) inoculation treatment for procuring active immunity against anthrax, hydrophobia, and other virulent diseases. It consisted in the injection of a preparation containing the particular organisms causing the disease. These organisms had their virulence reduced by growth under unfavourable conditions. When injected they stimulated the blood to produce antibodies which remained for some time and protected the person from the particular disease. The principle was based on the treatment of smallpox by vaccination, and Pasteur's inoculations were the forerunner of the modern practice of immunisation against infective diseases. See also BACTERIA and RABIES.

**Pasteurisation**, see DAIRY.

**Pastiche**, or **Pasticcio**, in literature or art, a patchwork of borrowings, or work in imitation of another's style. In music a stage entertainment for which the music was not written by a single composer, but

put together from various earlier works by any number of composers who happened to be popular. The words were therefore written to the music, not the reverse, as in opera, etc. In 18th-cent. Italy, however, words as well as music, especially from Metastasio's works, were often taken over by a P. The P. was especially fashionable in the 18th cent. The ballad opera and the vaudeville were both P.s of a kind.

**Pasto**, city of SW. Colombia, cap. of Nariño dept., on a flank of the P. volcano (14,000 ft), 140 m. NE. of Quito. It is the seat of a bishop, and has a univ. There are gold mines near, and it is a rich agric. centre. Pop. 27,600.

**Paston Letters**, correspondence of a Norfolk family of that name, together with state papers and other documents, covering the period from 1422 to 1509. They form an invaluable source of information on 15th-cent. life and manners, and on conditions during the Wars of the Roses (q.v.), as well as giving vivid portraits of some of the Paston family. The most complete ed. is that of James Gairdner (6 vols.), 1904; there is also an ed. in Everyman's Library. A fictional study based on the letters is *Beloved Lady*, by Barbara Jefferis, 1955.

**Pastor**, or Rose-coloured Starling (*Pastor roseus*), beautiful member of the starling family. The adult bird has a long crest which, like the head, neck, and throat, is glossy violet-black; the back, shoulders, and under-surface are a delicate rose-pink, and the wings and tail greenish-black. It is common in India and occasionally visits Europe.

**Pastoral Epistles**, see under TIMOTHY; TITUS.

**Pastoral Letter**, letter addressed by the bishop of a diocese to the whole body of clergy and the people under his jurisdiction. Such letters are usually read out from the pulpit of each par. church.

**Pastoral Poetry** is poetry descriptive of country life, and includes pastoral drama, in which the characters represent shepherds or other country people. Except in such cases as the Dorsetshire poems of Barnes, it is a perfectly artificial genre, and the rustic setting does little more than mask the thoughts and emotions of the country and era in which the pastorals are produced. The origin of the pastoral must be sought in classical literature. Aelianus makes Stesichorus of Himera (d. about 555 bc) its inventor, but the earliest extant pastorals are those of Theocritus (c. 270 bc). In these may be found the germ of the European pastoral, and many of the names of the shepherds and shepherdesses of Theocritus (e.g. Lycidas, Corydon, Daphnis, and Amoryllis) did duty in all countries. Virgil's 10 *Eclogues* also exercised considerable influence. In Italy the first vernacular pastoral romance is the *Ameto* of Boccaccio, 1342, but a more famous example is Sannazaro's *Arcadia*, 1504. Petrarch, and after him Mantuan, made the pastoral a veil for satiric treatment of women, courtiers, and ecclesiastics. Spenser's *Shepherd's Calendar*, 1578, owes much to the pastorals of

Mantuan. The first pastoral drama was Politian's *Favola di Orfeo*, which was produced at Mantua in 1472, and the most famous of its successors was the *Aminto* of Tasso, 1573. The most famous Sp. pastoral was Montemayor's romance of *Diana*, 1558, well known in Elizabethan England. In 1590 appeared Sir Philip Sidney's prose romance of *Arcadia*, which had, however, been written many years before. Many of the Elizabethan dramatists also wrote romances, mainly in the manner of *Euphues*. The best known of these is Lodge's *Rosalynde*, 1590. The pastoral drama found its 3 greatest exponents in Fletcher, *The Faithful Shepherdess*, Shakespeare, *As You Like It*, and Ben Jonson, *The Sad Shepherd*. Among the last masques in pastoral style was Milton's *Comus*. There was a revival of the pastoral in the 18th cent., which produced the pastorals of Pope and Ambrose Phillips, over which the pair quarrelled. Gay's *Shepherd Week* was intended as a parody of Phillips's, but was, in point of fact, the best of the group. It was, however, surpassed by Ramsay's *Gentle Shepherd*, 1728, in which the artificial element is less obtrusive. Since that time the pastoral has not been a popular poetic form. See E. K. Chambers, *English Pastorals*, 1887, and W. W. Greg, *Pastoral Poetry and Pastoral Drama*, 1906.

**Pastoral Staff**, see CROSIER and LIS-MORE CROSIER.

**Pastoral Theology**, branch of theology which deals with the duties of the clergy as shepherds of souls.

**Pastorales**, see BASQUES.

**Pasture**, term loosely applied to all grassland which is grazed at any time. It may refer to permanent P., temporary P. or ley, or even to rough grazings on hill land.

**Pasuruan**, or Passeroean, tn of E. Java, Indonesia, on the N. coast, 50 m. by railway SSE. of Surabaya. It has considerable trade. Pop. 37,000.

**Patagonia**, S. portion of S. America, lying E. and W. of the Andes, and divided between Chile and Argentina. The name P. arises from the nickname 'Patagones,' or big feet, applied by early Sp. explorers to the clumsily shod aborigines of the extreme S. The Chilean portion lies S. of Llanquihue and comprises the provs. of Chiloé and Magallanes (Magellan ter.), while the Argentine extends S. from the Rio Negro, and includes the ters. of Rio Negro, Chubut, and part of Santa Cruz (qq.v.). The whole W. region is occupied by the Andes, rising from 3000 to 6000 ft, with forests on the lower slopes; the rainfall is very heavy. The E. dist. is a plateau, rising in terrace fashion with layers of sandstone and basalt. A great part is barren, but in the N. part irrigation enables wheat to be grown, and immense flocks of sheep graze on the plains. The greater part is a vast plateau, almost uninhabited; the ter. of Santa Cruz has barely one inhab. to 25 sq. m. W. H. Hudson says: 'It has a look of antiquity, of desolation, of eternal peace, of a desert that has been a desert from of old, and will

continue a desert for ever.' In the Chilean portion of Tierra del Fuego is Punta Arenas, a flourishing tin and port, with a very large trade in wool. Patagonian output of wool averages 50,400 tons per annum. Petroleum is being produced at Springhill and Comodoro Rivadavia. The total area of P. is about 300,000 sq. m. The original natives belonged to 2 races, the Tehuelches, noted for their great stature, and the Gennakens, who are practically extinct. See also TIERRA DEL FUEGO.

**Patan:** 1. Walled tn of Bombay State, India, 64 m. NNW. of Ahmedabad. P. is on the site of the anct city of Anhilwara, in the 8th cent. AD the cap. of the Hindu Kings of Gujarat, which was captured by Mahmud of Ghazni about AD 1024.

2. Tn of Kathiawar Peninsula, Bombay, see SOMNATH.

**Patang,** see PAAN.

**Patani:** 1. Province of Thailand, between Kelantan and Singora, on the E. coast of the Malay Peninsula. Area 6000 sq. m. Pop. 199,252.

2. Tn, cap. of the above state, on the E. coast, in about 6° 51' N.

3. Cape on the E. coast of the Malay Peninsula, at the entrance to the Gulf of Siam.

4. Riv. of Thailand, Malay Peninsula, flowing NE. and N. through P. into the Gulf of Siam in about 6° 55' N.

**Patavium,** see PADUA.

**Patoh, Alexander McCarrell** (1889-1945), Amer. soldier, b. Arizona, son of a captain of West Point Military Academy. P. entered West Point in 1909, and was distinguished as an athlete. In the First World War he was a director of the Army Machine-Gun School in France, and later served in the Aisne-Marne, St Mihiel, and Argonne offensives. In 1936 he joined the Infantry Board at Fort Benning in Georgia, after diligent study at the general staff school and at the army college. In 1941 he commanded the infantry training centre at Camp Croft, in S. Carolina. In 1943 he was put in command of ground forces at Guadalcanal, taking part in the assault which drove the Japanese from the Henderson Field area, personally leading the attack which stormed Mt Austin. In March 1944 he succeeded Gen. Patton in command of the Amer. Seventh Army, leading the Amer. ground forces in the invasion of S. France.

See also WESTERN FRONT IN SECOND WORLD WAR.

**Patcham**, residential dist. of Brighton, Sussex, England, with a Doom painting in the par. church dating from the 12th or 13th cent., probably the oldest complete Doom shown in any church.

**Patching,** see NEEDLEWORK.

**Patchouli Plant, *Pogostemon heyneanus***, synonym *patchouli*, a soft-wooded shrub of about 3 ft. of India and Burma, family Labiatae, with small, whitish flowers with a purple tinge in June. It is the source of the Patchouli perfume, the Pucha-pat of the Hindus, of peculiar scent, held to be disinfectant. The leaves are distilled to extract a volatile oil; the dried plant used to stuff mattresses, pillows, etc. It

requires warm greenhouse culture in Britain.

**Patchwork,** see EMBROIDERY.

**Patel, Framjee Nasarwanjee** (1804-94), Parsee merchant and philanthropist, b. Bombay. In 1819 he began a successful business career in the firm of Frith, Romanjee & Company. At this time in India prominent merchants became *de facto* bankers, since few people had large capital resources. In 1844 P. founded the firm of Wallace & Company; from this he retired and in 1849 founded Framjee, Sands & Company. He will be remembered, however, for the work he did for his fellow countrymen in India. Since the Parsees were exiled from Persia, Parsee law was in a chaotic state, particularly as regards the laws of marriage and intestacy. P. served on a commission to investigate this and became president of the Parsee Law Association. He was held in high regard by both Indians and British.

**Patel, Vallabhbhai Jhaverbhai** (1875-1950), Indian Nationalist leader, b. near Nadiad, 30 m. S of Ahmedabad, then in Bombay Presidency. He first practised law locally and then went to England, where he was called to the Bar at the Middle Temple. On returning to India he practised at Ahmedabad, but soon took an active part in politics. His association with Gandhi (q.v.) and the Indian National Congress began in 1916, and lasted till his death. He soon evinced a remarkable flair for organisation, and was largely responsible for the striking success of many of the mass demonstrations and civil-disobedience campaigns stimulated by the Congress. It was on account of this exceptional gift that he was called 'Sardar' by Gandhi, a title by which he was commonly known thereafter. From 1924 to 1928 he was President of Ahmedabad Municipality and there showed that his talents included administration on a large scale. He was Chairman of the Congress Parl. Sub-Committee from 1935 to 1942, and in this position exercised close control over the first Congress ministries to take office in the provs. (now states). He was twice imprisoned during the Second World War together with all the prominent Congress leaders.

In the Interim Gov. of India, formed in 1946, he became Home Minister and Minister in charge of Information and Broadcasting. After independence and partition in 1947 he remained in these posts and also became *de facto* Deputy Prime Minister under Jawaharlal Nehru. In those capacities he was directly responsible for 2 outstanding achievements. One was the complete disruption of the Communist-organised all-India railway strike in 1949, and indeed the total defeat of the campaign of violence and lawlessness waged by Communists between 1948 and 1950; the other was the peaceful integration of the former princely states in the new India. That this was completed without undue rancour and, except in the peculiar cases of Hyderabad and Junagadh, without a show of force indicates not only a knowledge of power but also a knowledge of how to use it.

P., a practising Hindu as well as a fervid nationalist, probably never accepted the idea of a Muslim State; his agreement to the partition of India was the result of his intensely practical approach to all problems, but can never have satisfied his sentiment. His death deprived India of the most clear-headed and experienced of her leaders.

**Patella, see KNEE; LIMPETS.**

**Patén,** a shallow, circular dish used in the celebration of Mass. It is made of gold or silver gilt and solemnly consecrated. Upon it lies the sacrificial bread from the beginning of Mass until after the offertory; it is not used again until the breaking of the Sacred Host and the subsequent gathering of crumbs from the corporal (q.v.). The corresponding vessel in the oriental Liturgy is the *discus* (see *DISCUS*, 2). A P. is also used in the Anglican Communion service.

**Patener, Joachim** (c. 1480-1524), b. Dinant or Bouvignes, pupil of Quinten Matsys, worked at Antwerp and is noted as one of the earliest painters to make landscape a main element in pictorial composition. In 1521 he met Dürer, who mentions him as a landscape painter. Modern interest in landscape has given him special prominence as a pioneer.

**Patent Medicines, see PROPRIETARY MEDICINES.**

**Patents and Inventions.** P., or more correctly letters patent, are documents in which the Crown vests a subject with special rights or privileges; e.g. the privileges appertaining to the peerage are conferred on a newly made peer by the issue of letters patent. This article is exclusively devoted to such letters patent as confer upon a person the sole right to make, use, and vend an invention for a limited period of time. Such a grant creates a monopoly (see *MONOPOLY*) in favour of the patentee. Apart from copyright (q.v.) and trade marks (q.v.), P. are the only species of property which give an exclusive right. A trade mark differs from a patent by reason that 'it has not merit and the benefit of mankind as its consideration,' its object being 'to indicate the source from which an article comes; not to restrain others from manufacturing such articles.' There can be and is in law no exclusive right in a mere secret, and the original possessor of, for example, a secret process of manuf. cannot, in the absence of some contract, prevent another person from making use of his secret if he be successful in acquiring the knowledge of it, though it would be otherwise if the latter acquired the information confidentially from the former or during the progress of experiments conducted by the former. Difficulties as to the person entitled to a particular invention have very frequently arisen between masters and servants. The whole of this part of the subject of P. is obscure, but the principle underlying all the cases is that an employer who conceives an idea has no right to the inventions of a man, whether servant or an independent, whom he employs to carry it out.

To be entitled to letters patent for an

invention, the applicant must be either the 'true and first inventor' of the subject-matter or the 'true and first importer' of an invention from abroad. The first of the above 2 phrases by no means speaks for itself; but it is generally understood that an actual inventor includes not only a person who is incontestably and literally the first man to light upon and carry out a particular idea, but anyone who has embodied in practical form some idea which, in the main, is his own, though others may have contributed suggestions in details and improvements which in themselves do not amount to distinct and separate inventions. But it must always be borne in mind that if anyone who is concerned to upset a patent in the chancery div. of the high court can prove that the patent, though admittedly novel so far as the world generally is concerned, was not discovered by the ingenuity of the patentee, but was borrowed from some book or another person, the court will decide against the patentee. The 'true and first importer,' on the other hand, need have displayed no merit whatever to be entitled to a patent; e.g. he may be a mere agent or trustee of a foreign inventor. By the Patents Act, 1949, any person who has applied for protection for any patent in any foreign state with which the Brit. Gov. has entered into international arrangements for mutual protection of inventions is entitled to a patent for his invention in England in priority to other applicants; and such patent, on registration, will be dated as of the date of the protection previously obtained in the foreign state, provided the application is made within 12 months from the time of applying for protection in the foreign state. The above statutory provision applies also to such Brit. dominions as have entered into mutual arrangements with the mother country.

By the Statute of Monopolies (see *MONOPOLY*) P. for inventions last 14 years, but this term was increased by an Act of 1919 to 16 years. By the same Act the subject-matter of a valid patent can only be a 'new manufacture,' and the Act of 1949 defines 'invention' by reference to the old Act. A valid patent may be granted in respect of: (1) The discovery of a principle together with a method of applying it to a practical result or making it applicable to the production of a new manuf. (2) A new and useful combination of old parts. (3) The novel application of an old principle, provided a useful manuf. results; but the patentee cannot go outside the application which constitutes his invention, and the method of application must be really novel. (4) The application of an old material to a new purpose, provided there is actual novelty in the mode of using the old or known material or thing as distinct from the novelty of purpose. (5) The invention of processes for manufacturing well-known articles of commerce. (6) A new combination of new and old or all old processes, materials, or contrivances so as to produce or do something more cheaply or quickly or effectively than before.

Even if the ultimate result of a combination be both novel and useful, the combination will not be patentable unless there is invention or 'manufacture' in the mode of combination itself. (7) A new product, material, or machine. 'Novelty' as construed by the courts is essential. Either the patentee must be the true and first inventor, or the subject-matter of the grant must be a new manuf. in itself, or newly introduced into the realm. In the law courts, where 'novelty' is in issue, the inquiry really turns on how far there has been such 'prior use' or 'prior pub.' as will invalidate the patent. In this context it is to be noted that if a man makes an invention, the object of which is to obtain a new result, the patent is entitled to a much more liberal construction by the courts than if the invention were merely to obtain an old result by new means.

The element of novelty may be summed up in the following propositions: (1) If once the public generally become cognizant of an invention, no matter by what means, no patent can be granted for it. But everything essential to the invention must have been known in order to invalidate the grant. (2) The use of a thing for any particular purpose is not an 'anticipation' of a patent which claims the use of the same thing for an entirely different purpose. (3) Novelty is not the same as discovery, for a thing may have been discovered before, but never made public. (4) An invention that has been previously made by someone else, even though not disclosed to the public, is said to have been 'anticipated,' and if such anticipation be proved a patent cannot stand. (5) A prior unsuccessful experiment does not constitute publication. (6) Offering for sale amounts to pub. only if the article offered for sale shows the manner of its manuf. (7) Prior use in a Brit. dominion or colony will not bar the right to a patent in England. (8) Imparting a secret to another or others in confidence is not communication to the public unless the public generally have by reason thereof in fact become fully acquainted with the invention. (9) It is useless to try to upset a patent on the ground that some pub. book contains it, if in reality the book contains merely a suggestion of the invention as opposed to such a description as would enable a person to effect the manuf. The above principles may appear in the highest degree technical; but it is pertinent to observe that the progress of opinion against monopolies is inherently opposed to the endowment of any individual effort that cannot properly lay claim to originality.

To apply for a patent the inventor must first file a provisional or complete specification of the nature of his invention at the Patent Office, 25 Southampton Buildings, London, W.C. The services of an accredited patent agent are usually employed by the inventor to draw up the specification, for any substantial error in preparing the document may render the patent void; and further, if at any time during the subsistence of a patent someone can show that the description in the

specification is so incomplete that no one could produce the result claimed, the patent will be null and void. Sometimes, however, a patentee will be allowed to amend his specification if the erroneous parts do not vitiate the whole patent. After the specification has been deposited the examiner of the Patent Office investigates the application in order to see whether the specification and drawings properly describe the invention, and whether the invention claimed has in fact been described in some anterior specification deposited at the office in connection with any application for a patent made within 50 years next before the date of the application under examination. (A prior provisional specification not followed by a complete specification will not affect the claim.) The comptroller-general of P., having satisfied himself that the above requirements have been satisfied, causes the specification to be advertised in the official Jour. of P. The patent will then be sealed after 2 months, provided there is no opposition. There are only 4 grounds of opposition: (a) that the applicant got his invention from the opponent; (b) that the invention has been claimed in a complete specification for a Brit. patent of prior date other than one deposited pursuant to an application made over 50 years before the date of the application for the opposed patent; (c) that the specification does not sufficiently or fairly describe the nature of the invention or the manner in which it is to be performed; (d) that the complete specification describes and claims an invention different from that described in the provisional specification (a provisional specification protects for 6 months), and that the former really forms the subject-matter of an application made by the opponent in the interval between the hearing of the provisional specification and the complete specification. The comptroller's powers (which are subject to an appeal to the attorney-general) are, as may be inferred from the above enumeration of grounds of opposition, limited to determining either the identity of an invention or whether the applicant is fraudulent; he cannot oust the jurisdiction of the courts by deciding a question of infringement. The fees on patents for inventions are:

	£	s.	d.
On application for provisional protection	1	0	0
On filing complete specification	4	0	0
On notice to have patent sealed	3	0	0
On application for certificate of payment of renewal:			
Before the expiration of the 4th year from the date of patent, and in respect of the 5th year, £5; of the 6th year £6; of the 7th year, £8; then £2 more each year up to £16 for the 11th; then £1 more each year up to £20 for the 15th; then £20 for the remaining life of the patent.	165	0	0
Total	173	0	0



Other small fees are also payable as may from time to time be presented by the Board of Trade.

**Revocation.** Any person may petition to revoke a patent on the ground: (a) that it was obtained in fraud of his rights; (b) that he and not the grantee was the true inventor; or (c) that he has publicly used or sold the thing claimed as an invention before the date of the patent. If the petitioner satisfies the court that he is right, he may himself be granted a patent to expire on the date the revoked patent would have expired. A patent not less than 4 years old may also be revoked by the comptroller at the instance of anyone who shows that it has during those 4 years been worked mainly outside the U.K.

**Compulsory Licences.** A patentee may be ordered by the court to grant licences to work his patent if it can be shown that he has not himself adequately worked his patent, or manufactured his patented article, or granted licences on reasonable terms, so as to prejudice any existing, or the estab. of any new, industry.

**Infringement.** The remedy for infringement is by injunction (q.v.) to restrain further infringements, coupled with a claim either for damages or for an inquiry as to profits in respect of past infringements. The usual defences to such an action are: (a) a denial of infringement; (b) a denial that the plaintiff was the first and true inventor; (c) a denial of novelty; (d) an allegation of the insufficiency or incompleteness of the specification; (e) an allegation that the patent has been worked principally abroad; (f) an allegation of fraud on the defendant's rights; and (g) a denial of utility (doubtful as a defence).

The procedure in applications for the grant of P. is contained in the P. Rules, 1949 (S.I. 1949, No. 2385) and the P. (Amendment) Rules, 1955 (S.I. 1955, No. 117). The full list of fees payable on the grant of P. is contained in those rules.

In view of much criticism of the existing Patents and Designs Acts, the gov. in 1944 appointed a departmental committee under the chairmanship of Kenneth R. Swan to consider what changes were desirable in the Acts (1907-38), and in the practice of the Patent Office and the courts. Recommendations made in the first interim report of the Swan Committee (Cmd. 6618, April 1945) were embodied in a short amending Act of 1946. This Act modified existing practice as a matter of urgency in view of patents lapsing daily, to enable patentees, who had been prevented from working their P. by war restrictions, to resume working under extended patent protection as soon as possible.

Important changes in the law relating to P. and registered designs were made by the gov. in an Act to give effect to many of the recommendations of the Swan Committee's second interim and final reports (Cmd. 6789, April 1946, and Cmd. 7206, Sept. 1947). The new Act makes no changes in fundamental principles, but

adapts patent law to modern requirements. One of the main purposes of the Act is to strengthen the provision against abuse of patent rights or the insufficient use of patented inventions. This is to ensure that inventions are used to the fullest extent to increase industrial efficiency. All the existing remedies are retained, but the circumstances in which they can be resorted to are extended to cover cases where the invention is not being worked to the fullest extent, or where an export market is not being supplied, or where the working of another patent is hindered by the refusal of the patentee to grant a licence on reasonable terms. The Act provides for action being taken by a gov. dept. in the public interest, particularly in cases adversely reported on by the new Monopolies and Restrictive Practices Commission. This commission has power to inquire into all restrictive practices affecting P., but the Act which constituted it does not provide specific action to follow on adverse reports. Other clauses modify the provisions relating to the use of patented inventions for the service of the Crown, and make permanent provision for ensuring secrecy of inventions in the interests of the defence of the realm. The courts have held that when the patentee himself uses an invention for the services of the Crown a gov. dept. cannot relieve him of his contractual obligations to other persons. The Act provides this relief. When others are authorised to use the invention the patentee will, in general, receive compensation, but it is provided that he shall be liable to share this with any other person entitled to contractual rights against him. The Act also provides that an application for a patent may be made by the assignee of an inventor, and an inventor's application may be taken over at any time by his assignee. There will be introduced a new system of dating P. and allowing priority based either on provisional specifications or on earlier applications in countries belonging to the International Convention for the Protection of Industrial Property. Another amendment of the law will help to protect the position of an inventor who is an employee in the event of a dispute arising with his employer as to the rights of the parties in respect of the invention. Power is given to the comptroller of P. to settle such disputes in appropriate cases, and he may act upon an application by either of the parties. This will enable an inventor to have a claim decided without incurring the heavy expense of a court action against an employer. It is proposed that in future all appeals from the comptroller's decisions should go to the P. Appeal Tribunal. The Act came into operation on 1 Jan. 1950.

In order to secure for Britain and its industries the benefit of inventions and discoveries by Brit. scientists the gov. in April 1948 introduced a Bill to establish a national corporation for the development and exploitation of inventions, to which body the Board of Trade may make advances of up to £5m., within 5 years of its estab., for working capital. The

during their course; the inquiry into their causes forms the dept. of aetiology. Until Virohow pub. his *Cellular Pathology* in 1858, the science was hardly in existence, for not until the microscope revealed the fact that man was a community of living cells was it recognised that their vicissitudes were the true basis of the study of human disease. The rapid and wonderful development of biochemistry has made important contributions to knowledge of the metabolism of the cell in health and in some forms of disease; of the production of endocrines and their effect on the body; of toxins and anti-toxins. Pasteur's (q.v.) work, originally chemical, in connection with fermentation, led to bacteriological science, and showed that the cell had friends and enemies; his eradication of specific disease among silkworms conclusively showed how science could wage war on germs inimical to cells. Kock's discovery of the anthrax bacillus in 1876 and the tubercle bacillus in 1882, by his culture method of isolating bacteria, led to the discovery of the organisms responsible for fowl cholera, septic disease, typhoid, cholera, diphtheria, tetanus, etc. Lister's work in antiseptic treatment of wounds was of equal importance, and Jenner's in smallpox; nor must the peculiar genius of Huxley, outside the ranks of medical scientists, be overlooked. In 1893 Theobald Smith, in the case of bovine malaria or Texas fever, showed for the first time that parasites (q.v.) such as the tick could act as intermediary hosts and transfer disease from animal to animal; Manson and Ross proved that malaria was transmitted by a mosquito (*Anopheles*), so that every parasite has subsequently been a suspected agent in the transmission of disease. Ehrlich's researches in chemotherapy, with his theory of 'side-chains' or 'receptors', proved of great use in practical investigations. Metchnikoff's study of immunity and the discovery of anti-toxin by von Behring were also landmarks in the general advance. Great as had been the advances in bacterial pathology, medicine at the turn of the century was almost entirely clinical in practice and empirical in treatment. The clinician was at the bedside, the pathologist in the laboratory. It was not to be long before the practical applications of pathology began to extend into clinical medicine, and this century has seen the birth of the clinical pathologist. The science of pathology now includes bacteriology, immunology, histology, morbid anatomy, haematology, chemical pathology. Bacteriology and immunology were the first laboratory sciences to intrude into bedside medicine. In 1906 Wasserman, Neisser, and Bruck perfected the complement-fixation reaction diagnostic test for syphilis (q.v.). At about the same time Almroth Wright developed the autogenous vaccine. In 1908 Schick introduced his test for susceptibility to diphtheria, and von Pirquet (1907) and Mantoux (1910) the tuberculin sensitivity tests. The Dicks (1924) followed with a test for susceptibility to scarlet fever. The natural sequence of these events was

the development of measures for immunisation and the prevention of epidemics. In the decade following 1930 much work was done in differentiating the various strains of bacteria by selective culture media and what is known as 'phage typing.'

Chemical pathology is now largely the science of blood chemistry, a science brought into importance by the discovery of insulin in 1922 by Banting, Best, and Macleod, and the consequent need to estimate the sugar content of blood in diabetics being treated with insulin. Since chemical change is the basis of all physiological function, the importance of the biochemist will continue to increase in the future in the diagnosis, control, and cure of disease. The discovery by Minot and Murphy in 1926 of the curative effect of liver in pernicious anaemia brought the haematologist to the fore as an active agent in the accurate diagnosis and controlled treatment of that disease. The discovery of the rhesus factor in blood by Landsteiner and Wiener in 1940 was the start of continuing discoveries of other factors which have made blood transfusion, and the investigations of pregnancy, haemolytic anaemias, and diseases of newborn infants a highly specialised subject (see OBSTETRICS and PREGNANCY). Some progress has been made in the recognition of the relation between psychogenic phenomena and the glandular secretions, and possibly the greatest advances in the future will be made in connection with psychopathology. The discovery of the sulphonamide drugs, such as sulphanilamide, and antibiotics such as penicillin (q.v.), streptomycin (q.v.), and chloramphenicol (q.v.) have provided new weapons in the battle against bacteria. See also BIOLOGY; BACTERIA; PARASITOLOGY; CANCER; PSYCHOPATHOLOGY; TUBERCULOSIS.

See E. R. Long, *History of Pathology*, 1928; A. W. Hewlett, *Pathological Physiology of Internal Diseases* (3rd ed.), 1928; H. D. Power and W. W. Hala, *Principles of Pathology*, 1929; W. G. MacCullum, *Pathology* (7th ed.), 1940; R. Muir, *Textbook of Pathology* (6th ed.), 1951; W. Boyd, *Surgical Pathology* (7th ed.), 1955; H. T. Karsner, *Human Pathology* (8th ed.), 1955; E. T. Bell, *Textbook of Pathology* (7th ed.), 1952; and E. H. Kettle, *Pathology of Tumours* (3rd ed.), 1945; B.M.A. Ed. H. A. Clegg, *Fifty Years of Medicine*, 1950.

Pathology of Plants, see PLANTS.

Patiala and E. Punjab States Union (PEPSU), federation of Indian states set up on 5 May 1948. It is formed of the states of Faridkot, Jind, Kalsia, Kapurthala, Malerkotla, Nabha, Nalagarh, and Patiala, and more than one-third of the inhab. are Sikhs. Patiala is the H.Q.

Patience, generic name for card-games for 1 player. There are over 500 P. games, some requiring skill and luck, some merely luck. Until the end of the 19th cent. rules were passed down orally, and there may still be games unrecorded. Many P.s, however, differ little from their fellows

except in the nature of their lay-out. Most are based on the principle of building the whole pack in ascending or descending sequence on specified 'foundation' cards: if the player succeeds in this he 'wins.' As an example, here is the well-known game of Carlton. Shuffle 2 packs together and deal from left to right a row of 8 cards face upwards; then a row of 7 overlapping the top row; then 6 and so on down to 1, to form a lay-out of 8 depot columns. The bottom card for the time being of each column is exposed and playable to foundation aces—which are laid aside to form a foundation row as they appear in play—in ascending sequence of suit, and to depots in descending sequence of alternate colour, the object of the game being to build both packs on foundations. A sequence or part of a sequence ending in an exposed card may be played from depot to depot if it will fit. When all the cards of a column have been played the resulting space must be filled with any exposed card or sequence. When all available cards have been played, deal from left to right 1 card face upwards to the bottom of each depot column overlapping the card already there. No card may be played at this turn until every depot column has received its addition. Continue to play and deal in this way until the pack is exhausted. Only 1 deal through the pack is allowed.

Other games are based on 'pairing,' like Pyramid. Deal a pyramid of 28 cards in 7 rows, 1 card at the top, a row of 7 at the bottom. The 2 second-row cards overlap left and right corners of the top card, and so on. All cards in the bottom row are exposed and available to begin with; when 2 adjacent cards are played they uncover 1 in the row above, which becomes available in its turn. The dealing card and the top card for the time being of the discard pile are also available for pairing. The object is to lay aside the whole of a single pack in pairs of cards whose pips add up to 13, jack counting 11, queen 12, and kings being laid aside singly.

Patino, see PATMOS.

Patio (Sp.), in a Sp. or Sp.-Amer. house, an inner courtyard, corresponding to the It. *cortile*.

Patmore, Coventry Kersey Dighton (1823-96), poet, b. Woodford, Essex, the son of Peter George P. (1786-1855), author and sometime editor of the *New Monthly Review*. He began to write poetry while still at school, and pub. his first vol. of verse in 1844. Two years later he was appointed to an assistant librarianship in the Brit. Museum. In 1849 he contributed to the organ of the Pre-Raphaelites, the *Germ*. He was largely responsible for promoting the volunteer movement of 1851. His prin. poetical works are *Poems*, 1844, *The Betrothal*, 1854, *The Espousals*, 1856, *Faithful for Ever*, 1860, and *The Victories of Love*, 1862: the 4 poems, and a selection of earlier poems, making up *The Angel in the House*, 1863, *Odes*, 1868, and *The Unknown Eros*, 1877. While he is not to be identified with the intellectual movement of the mid-19th cent. or with

the Pre-Raphaelites, he has a gift of verse somewhat akin to Wordsworth's in its simple, dignified treatment of homely themes. *The Angel in the House* is really a novel in verse, with domestic virtues as its poetical theme. The more philosophical parts of the poem reveal the mysticism which is to be found still more developed in *The Unknown Eros*, a series of odes notable for the poet's power of expressing intricate thought in verse. Eds. of his poems include that of 1897 (new uniform ed.) and of B. Champneys, 1906, who ed. also his correspondence, 1900. See studies by Sir E. Gosse, 1905, and O. Burdett, 1921; also F. Page, *Patmore: a Study in Poetry*, 1933; D. Patmore, *Portrait of my Family, 1783-1896*, 1935, and (ed.) *The Life and Times of Coventry Patmore*, 1949.

Patmos (It. *Patmo*), volcanic, rocky, and barren is. (length 7½ m., greatest breadth 4½ m., area 22 sq. m.) belonging to the Dodecanese in the E. Aegean. Here St John the Evangelist is believed to have written his Revelations after his banishment by Domitian in AD 95. The monastery of St John was founded in 1083 by St Christodulus. Pop. 2600.

Patna, city and cap. of Bihar State, India, lies on the Ganges, opposite the confluence of the Gandak, 140 m. E. of Benares. The P. high court came into existence in 1916. There is a federal univ., founded 1917, and a fine library, which contains a famous collection of Persian and Arabic MSS. The Gola is an immense circular structure built in 1786, designed as a granary but seldom so used. The anct and beautiful Pataliputra, which Megasthenes describes as Palibothra, and which Asoka aggrandised, once stood on the site of P.

Paton, Sir Joseph Noël (1821-1902), painter of Pre-Raphaelite affinities, b. Dunfermline, Fife. A member of the Royal Scottish Academy, 1850, he exhibited at the Royal Academy from 1856 to 1869, his subjects being taken largely from legend and history. The Quarrel of Oberon and Titania exhibits much imaginative power and a bewildering variety of detail. In other pictures, e.g. 'Lux in Tenebris,' 'Mors Janua Vitae,' and 'The Evening Star,' he worked in a religious and didactic vein. A fabulous rose window in Dunfermline Abbey was designed by him. He achieved some success as a poet, and many of his songs have been set to music.

Patras, or Patrae, third largest port of Greece and the cap. of the dept of Achaea on the Gulf of Patras. It exports currants, wines, skins, and wood products. An important city in the days of Augustus, it became the cap. of Achaea under the E. empire, but was destroyed by the Turks in 1827. The modern city is built to a regular plan. Pop. 79,000.

Patras, Gulf of, inlet of the Ionian Sea, opening out of the Gulf of Corinth, between Aetolia to the N. and Achaea to the S., on the W. coast of Greece. Length 30 m.

Patres Conscripti, see SENATE.

Patriarch (Gk *patriarchēs*, the head of a family): 1. Name given to the fathers of

the human race, spoken of in the Scripture hist., such as Noah, and also to the great progenitors of the Heb. race, Abraham, Isaac, Jacob, and Jacob's twelve sons.

2. Name also given in the Christian Church to the bishops of certain metropolitan sees, especially in the E. The sixth canon of the Nicene Council mentions Rome, Antioch, and Alexandria as the 3 metropolitan sees at the time.

Patricians (Lat. *patricii*, the kin of the *patres*, or heads of the old Rom. *gentes*, or tribes) were the aristocracy of anct Rome. In primitive times they were the whole *populus Romanus* (Rom. people), who assembled together in the national *comitia curiata*. The political hist. of early Rome is an account of the fierce and prolonged struggle between the upstart plebeians (q.v.), sprung chiefly from the conquered tribes, and the hereditary P., descended from the old Rom. families. The victory rested with the former, who by 300 bc were eligible for all the offices of state, from the quaestorship to the dictatorship, and even for the pontificate, long jealously withheld. Constantine changed the meaning of *patricius*, by making it a title of the highest honour conferred on persons who enjoyed the chief place in the emperor's esteem. Under the old Rom. law no child was released from *patria potestas* (father's power) by having any dignity or office (except a vestal virgin). Justinian conferred the privilege of being *sui juris* or independent of the paternal power on those enjoying the dignity of the patriciate, the son being freed immediately on the grant of the Imperial patent. The power of making *patricii* was, in general, used very sparingly by the emperors, and hence the title became an object of ambition even to foreign princes. The anct order of *patricii* was in time replaced by the *nobles*, whose rank depended on their wealth and office.

Patrick, St (c. 385-c. 461), son of a Rom. official named Calpurnius, who administered municipal affairs in Britain at Bannavem Taberniae. This is a lost place name, but modern scholars appear to agree that it was situated on the shores of the Severn estuary. During a pirates' raid on the dist., Patrick, aged 16, was captured near his father's villa and taken to Ireland where he was sold as a slave. (His task was to herd his master's swine on the slopes of a nearby mt.) This was a searing experience for the Christian boy, but he learned how to pray in his solitary captivity and was thus initiated into the mystical life. When he was 22 the spiritual prompting on which he had learned to rely advised him to make a bid to escape, and told him the direction to take in order to board a ship making ready to sail. He walked 200 m. in obedience to this direction, succeeded in boarding the ship and, after many further adventures, rejoined his kinsfolk.

He now began to have a vision in which he heard the voices of Irish children crying to him to come back again to them. Convinced of his vocation to be a priest, he went to France, probably first

to Lérins and then to Auxerre, to study for ordination. Shortly after he was ordained, he realised his ambition when Pope St Germanus sent him to Ireland to replace a missionary named Palladius, who had died within a year of undertaking the mission.

St P.'s procedure was bold and vigorous. Soon after his arrival in Ireland, he presented himself at the High-King's court at Tara, demanding permission to preach the Gospel. His knowledge of the people and of their language stood him in good stead. Although the work of evangelising Ireland was full of hardship, and St P. was often in danger of his life from the Druids, the results attracted the notice of the Christian world. In a little more than 10 years, he had the whole country linked up with churches, staffed by a zealous native clergy, to whom a tide of conversions was steadily flowing, and he was in a position to establish the seat of the primacy at Armagh. The number of Irish men and women who volunteered for the monastic life surprised even himself, although he gave such a heroic example of austerity and endurance. For nearly 30 years he was never absent from his people, 'afraid,' as he tells us himself, 'to lose the labour which I began.' When he was already elderly, he spent the 40 days of Lent on the summit of Croagh Patrick, maintaining an unbroken fast in a mighty appeal for the perseverance of the Irish people in the Faith.

There was an intensely personal element in the story of Ireland's conversion to Christianity. The story of the runaway slave who came back of his own accord to bring the Gospel to a people who had cruelly used him laid such a hold on the imagination of the Irish that St P. became the subject not only of their veneration but of the deep human affection which distinguishes his cult. In their subsequent dispersion throughout the world, they carried and handed down to posterity this warmth of feeling for the national apostle. While his feast day on 17 Mar. is a holiday of obligation and a national holiday in Ireland, it is also celebrated by the Irish race all over the world.

St P. has left 2 documents of great value and unquestioned authenticity: his *Confession* and his *Epistle to Coroticus*, which present a remarkable self-portrait. See lives by J. B. Bury, 1905, and Eoin MacNeill, 1934; also J. Ryan, *Irish Monasticism*, pp. 59-96, 1931; T. F. O'Rahilly, *The Two Patricks*, 1942; Dr Ludwig Bieler, *Life and Legends of St Patrick*, 1928, and *Works of St Patrick*, 1953.

Patricroft, tn of SE. Lancashire, England, 5 m. W. of Manchester, with silk throwing and weaving mills, cotton mills, quilting factories, iron works, etc. Pop. 24,239.

Patrippassians, see MONARCHIANISM.

Patristics, Patrology, see FATHERS OF THE CHURCH.

Patroclus, see ACHILLES.

Patrol (ultimately from Fr. *patrouiller* = *patouiller* (= to flounder in mud), detachment of troops sent out in advance of the

main body to reconnoitre the country and gain information as to the position and movements of the enemy. The same duties are now often carried out by armoured cars or tanks, and of course by reconnoitring aircraft during mobile warfare, especially during pursuit. Military P.s are of two kinds: 'reconnaissance,' usually in search of information above the ground, and especially about mines, and 'fighting' P.s, usually in search of information about enemy strength. They must fight to obtain prisoners or identifiable corpses. The chief non-military use of the term is in connection with motorised police detachments and the fire-fighting sections of forestry services. See also DOVER PATROL.

**Patron** (Lat. *patronus*, from *pater*, father), important term in Rom. law. It was the duty of the *patronus* to safeguard the interests of his *clientes* (dependants), men, that is, who were not admitted to the full rights of citizenship. The P. fed, boarded, and advised his client, gave him land usually, and was his representative in the eyes of the law. In return the client obeyed him, followed him to war, and gave him pecuniary aid. In the latter days of the republic the client was practically a free citizen; under the empire he was often merely a sycophant in his P.'s household. Technically a P. in Great Britain is one who has a church living in his gift, but the word is generally used of all benefactors and protectors, including the saints.

**Pattern-making**, see CASTING.

**Patti, Adelina** (1843-1919), It. singer, b. Madrid. At an early age she gave a series of concerts. After a course of training, she made her début in New York in 1859 as Lucia in the opera by Donizetti. In 1861 she went to England and took London by storm with the exquisite clearness and beauty of her voice. The year after she went to Paris, and she resided there until 1870, paying yearly visits to London, where she remained the prime favourite for many years. Her most famous parts were those in *Puritani*, *Sonnambula*, *Norma*, *Tro-vatore*, *Lucia di Lammermoor*, and *Traviata*. In later years she gave up the stage for the concert hall. She married the Marquis de Caux, but was divorced from him in 1885; in the following year she became the wife of the It. tenor Nicolini. On his death in 1898 she married the Baron Cederström. See H. Klein, *The Reign of Patti*, 1920.

**Patti**, coastal tn in Sicily (q.v.), 32 m. WSW. of Messina (q.v.). It is on the Bay of P., an inlet of the Tyrrhenian Sea (q.v.), and has a 13th-cent. cathedral. Near by is the site of *Tyndaris*, a tn founded by Dionysius the Elder (q.v.). Pop. 12,000.

**Pattison, Mark** (1813-84), scholar, b. Hornby, Yorks. Educ. at Oriel College, Oxford, in 1839 he became a Fellow of Lincoln, and in 1861 Rector. In 1875 he pub. a life of Casaubon. His *Sermons and Collected Essays*, ed. by H. Nettleship, appeared in 1889; his introspective *Memoirs*, ed. by his wife, were pub. in

1885. See L. Tollemache, *Recollections of Pattison*, 1895.

**Patton, George Smith** (1885-1945), Amer. general, b. San Gabriel, California, of a family of soldiers. P. graduated at W. Point in 1909. Commissioned in the cavalry, he was aide-de-camp to Gen. Pershing in 1916 in Mexico, and later, in the First World War, was a captain on Pershing's staff and attended a course at the Ft. Tank School. He organised the Amer. Tank Centre and also an Amer. tank brigade, which he commanded with distinction in the Saint-Mihel attack of Sept. 1918, and later in the Meuse-Argonne battles. Between the world wars he held a cavalry command, served in Hawaii, and became a lieutenant-colonel. In 1940 he was appointed to command the 2nd Armoured Div., becoming, in 1941, commanding gen. of the First Armoured Corps. In anticipation of the allied N. African campaign he estab. a desert training centre in California and built a co-ordinated offensive force. He led the Amer. attack on Casablanca, and was afterwards chosen to command the Seventh Army in the invasion of Sicily. In April 1944 he was transferred to the W. front, taking command of the Third Army. He cut off the peninsula of Brittany and then swept on to Paris, the Ger. frontier, and the Siegfried line. When the Germans made their last big effort of the war in the Ardennes offensive, P., whose forces were fiercely engaged on the Saar, answered the First Army's call for help by pulling out and changing direction to strike 60 m. northward over frozen roads against von Rundstedt's (q.v.) flank, probably his greatest military feat. In the advance to the Rhine, after von Rundstedt's repulse, he again played a leading part. Crossing the Rhine at Frankfurt, he maintained the impetus of his advance through central Germany and into Bohemia. Prague lay open to him, but for political reasons he was not allowed to occupy it, and at Pilsen his great advance ended. In April 1945 he was nominated a full general and his army occupied Bavaria. Owing to his scepticism over the necessity for the 'de-Nazification' programme, he was removed from the command of the Third Army and transferred to the command of a skeleton force, the Fifteenth Army. He d. as the result of spinal injuries received in a motor accident near Mannheim. He pub. *War as I Knew It*, 1947. See also J. Wellard, *The Man in a Helmet*, 1947; H. H. Semmes, *Portrait of Patton*, 1955.

**Pátzcuaro**, tn in the prov. of Hainant, Belgium, 5 m. SW. of Mons. There are coal mines, construction workshops, and manufs. of paints and shoes. Pop. 10,600.

**Pátzcuaro**, tn of Mexico in the state of Michoacán, situated near the lake of the same name. The lake, which is 6700 ft above sea-level, is 30 m. in circumference, with native Tarascan vils. on its shores and is. Wildfowl and fish are abundant. The tn, which has narrow cobbled streets, is 270 m. from Mexico city. Pop. about

10,000. See M. Toussaint, *Pátzcuaro*, 1952; U.N.E.S.C.O., *New Horizons at Tzintzenhuaro*, 1953.

**Pau**, Fr. tn, cap. of the dept of Basses-Pyrénées, on the Gave de Pau. It was the cap. of Béarn (q.v.) and of Fr. Navarre (see NAVARRA). The anct castle was the bp. of Henry IV of France (q.v.). P. trades in horses, wine, leather, and rugs. It has a mild climate, and is a much-frequented health resort. Bernadotte (see CHARLES XIV) was b. here. Pop. 46,200.

**Pauker**, Ana (1894- ), Rumanian politician, of Jewish descent. She studied medicine in Switzerland, and became a Communist in 1921. She was imprisoned sev. times, during the intervals spending some time in Russia and the U.S.A. In 1941 she was released from prison in an exchange of prisoners between Rumania and Russia, and joined the Red Army. P. returned to Rumania in 1944 and immediately acquired great political influence, becoming head of the Rumanian Communist party. From 1947 to 1952 she was foreign minister, but was generally considered to be the real ruler of Rumania during that period. In 1952, however, she suffered political eclipse. Though generally regarded as utterly ruthless, it is probable that P. was considered too independent a personality by the Soviet regime in Moscow, and her dismissal marked a further step in complete Russian domination of Rumania.

**Paul**, St, the Apostle (c. 3-c. 67), the great apostle of the Gentiles, was b. at Tarsus in Cilicia. Though a Jew of the tribe of Benjamin, a Hebrew sprung from Hebrews, he was by birth a Rom. citizen, having inherited this privilege from his ancestors, upon one of whom it had been conferred. The exact year of his birth is uncertain, and the first mention of his name in the N.T. writings is in connection with the martyrdom of St. Stephen (AD 33). His Jewish name was Saul, the form Paul being used in the Gk and Rom. world. It is highly improbable that there is any connection between this name and that of his first great Gentile convert Sergius Paulus. Saul learned the art of tent-making, of which industry Tarsus was a local centre; for it was a custom among the Jews to instruct their youth, even of the highest respectability, in some mechanical art. He was educated in the learning of the times, and later went to Jerusalem to study the laws and traditions of his people under Gamaliel, a distinguished Rabbi. Being a man of great talent, ardent mind, and inflexible resolution, and being devotedly attached to the institutions of his country, he contemplated with alarm and anxiety the progress of the new religion. Accordingly he took an active and prominent part against the Christians, pursuing them with zeal and unrelenting fury. He obtained letters from the Sanhedrin to the synagogue of the Jews at Damascus, and also to the governor, authorising him to apprehend and bring to Jerusalem whomsoever of the disciples he might find there. While on this journey his miraculous conversion

took place. The journeys and events of his laborious life up to his captivity in Rome are described in the Acts of the Apostles. He may subsequently have revisited the E. and Spain. P. suffered martyrdom at Rome c. AD 67.

The Canon of the N.T. assigns to P. the authorship of 13 epistles, and the Rom. Catholic Church also attributes to him the Epistle to the Hebrews. Some of his speeches are recorded in the Acts. From these writings we learn that P. suffered from physical disability, the exact nature of which is unknown. But though weak in body, he was a man of unflinching energy and of a bold and passionate nature.

**Theology of St Paul.** The letters and speeches of P. which have come down to us were all directed to one purpose, the proof of Christ's claims to be the Messiah promised to the Fathers and the exposition of what these claims meant, with exhortations to the fulfilment of moral duties and advice as to the management of eccles. affairs. P.'s interpretation of the meaning of his Lord's work was accepted by the early Church, as may be seen in 1 Pet., the Johannine writings, and epistle to the Hebrews. It is difficult to formulate Pauline theology, because we have to cull it, not from treatises, but from occasional letters which only contained what bore on the question at issue. All that can be attempted is to sketch the system of P. in its central ideas. To P. as a Jew, righteousness, with its converse, sin, is of primary import; this at first was purely external, but the Tenth Commandment led him to recognise the spirituality of the demands of the law (Rom. vii. 7). Over against this is his Christology. The crucifixion was the 'stumbling block' which hindered him from recognising Jesus as the Christ. When Jesus met him on the way to Damascus he was forced to recognise His Messiahship; with this the problem assumed a new shape. The question 'Why had the Messiah died?' led P. to the idea of atonement: 'The wages of sin is death,' but He had no sin. Hence P. was led to look on His death as substitutionary. Death was wide as the race, therefore sin must also be universal; if so, the origin of sin must be found in the origin of the race, 'in Adam all died.' Jesus is the second Adam in whom 'all are made alive' (1 Cor. xv. 22); the result of the physical union to the first Adam is counterbalanced by spiritual union to Christ (1 Cor. vi. 17). All, however, do not benefit by the life-giving power of Christ's death: only those who believe. Those who believe are to be received into glory at the coming of the Lord (1 Thess. iv. 15). With this is connected the Last Judgment and the resurrection (Acts xvii. 31; 1 Tim. iv. 16). P. did not look forward to the salvation of individuals only, and that in a future life; he also contemplated a regenerated society on the earth. The Church, the assembly of all believers, was the new Israel. From the old covenant he drew the idea of the conjugal symbol for the relation of the

Church to her Lord (Eph. v. 32). The Church was to be a self-sufficing republic, not going before civil tribunals (1 Cor. vi. 1-6). The psychology by which P. explained conversion and the consciousness of sin after it, as also inspiration and prophecy, and the explanation he gives of the rise of Church orders, are all subjects of study.

The works on St P. are very numerous. See W. J. Conybeare and J. S. Howson, *The Life and Letters of St Paul*, 1862; F. C. Baur, *Paul, his Life and Work*, 1873; O. Pfleiderer, *The Influence of the Apostle Paul on the Development of Christianity*, 1885; A. Sabatier, *L'Apôtre Paul* (trans.), 1891; B. G. Stevens, *The Pauline Theology*, 1892; A. B. Bruce, *St Paul's Conception of Christianity*, 1894; J. G. Machen, *Origin of Paul's Religion*, 1921; P. Prat, *Théologie de St Paul* (trans.), 1926, and *St Paul* (trans.), 1928; C. A. Scott, *Christianity according to St Paul*, 1927; A. Schweitzer, *Mysticism of Paul the Apostle*, 1931; C. H. Dodd, *The Mind of St Paul*, 1936; J. Maritain, *St Paul*, 1942, 1948; and R. Sencourt, *St Paul*, 1948.

**Paul, Canons of St.** see BARNABITES.

**Paul**, the name of 5 popes:

**Paul I** (757-67), a brother of Stephen II. With the help of Pepin, King of the Franks, he continued the opposition to the Lombards, but his pontificate was of little importance.

**Paul II** (1464-71) (Pietro Barbo), b. Venice, 1417 or 1418. He added greatly to the magnificence of the city of Rome. In 1470 he decreed the observance of the Jubilee every 25 years.

**Paul III** (1534-49) (Alessandro Farnese), b. Cambrino, 1468, belonged to a noble family. He was a man of great learning and wealth, unequalled in tact and diplomacy, but his early life was stained by immorality. After his consecration much opposition was excited by the elevation to the cardinalate of his 2 young grandsons, aged 14 and 16 respectively. He convoked the Council of Trent, which assembled in 1545, and approved the foundation of the Society of Jesus.

**Paul IV** (1555-9) (Giovanni Pietro Caraffa), b. Capriglio, 1476, came also of an illustrious family. His early life had been most ascetic, and he was one of the founders of the order of Theatines. His pontificate was marked by many reforms, though when elected he was already 79 years of age. His diplomatic ability was less marked, as was shown by his relations with England and Cardinal Pole.

**Paul V** (1605-21) (Camillo Borghese), b. Rome, 1552, had been specially trained in jurisprudence, and his excellence as a canonist is shown in the course of his pontificate. He was a strict disciplinarian, and his excommunication of the Republic of Venice produced a schism which lasted a year. He did much for the city of Rome itself.

See F. Hayward, *History of the Popes*, 1929, Eng. trans. 1931.

**Paul I** (1754-1801), Russian emperor,

son of Peter III and Catherine II, succeeded his mother in 1796. He re-established primogeniture as the basis for succession to the throne, repealing Peter I's law that each emperor could choose his successor; he also repealed Catherine II's Charter for the Gentry and restricted the labour a serf had to do for his squire to 3 days a week. But he was a pedant and a tyrant, causing dissatisfaction among his *entourage*, and he was strangled during a palace revolution in favour of his son Alexander I. Russian foreign policy under P. sought to resist the domination of Europe by either France or England. Russia took part in the anti-French coalition, 1798-9, when Suvorov (q.v.) won great victories over the French in Italy.

**Paul** (1901- ), King of the Hellenes, brother of George II (q.v.), whom he succeeded in 1947. He married Princess Frederika of Brunswick in 1936, by whom he has 3 children, his son, Prince Constantine (b. 1940), being heir-presumptive to the Greek throne. P. has attempted to popularise the Greek monarchy; and has identified it closely with Greek aspirations in Cyprus.

**Paul, Father (Paolo Sarpi)** (1552-1623), Venetian patriot and ecclesiastic, is important chiefly for his place in the contest between the city of Venice and the papal see during the pontificate of Paul V, in 1606. He carried on a vigorous controversy with Bellarmine as to the papal prerogatives, and his activity led to his excommunication and attempted assassination in 1607, in which he was severely wounded. His most important literary work is a highly tendentious *History of the Council of Trent*, 1619.

**Paul, Jean**, see RICHTER, JOHANN PAUL FRIEDRICH.

**Paul, Vincent de**, see VINCENT DE PAUL.

**Paul-Boncour, Joseph** (1873- ), Fr. politician, b. St Aignan-sur-Cher. After a brilliant career at the Univ. he was called to the Paris Bar. In 1900 he pub. *Le Fédéralisme économique*. In 1906 he was elected to the Chamber as an Independent Socialist for the dist. of Loire-et-Cher. In 1911 he joined the Socialist party and became Labour minister in the Monist-Bertaux Cabinet. During the First World War he held a command in Lorraine. P. left the Socialists in 1931. He was a prominent member of the trade delegation to the League of Nations and took part in the discussions on disarmament. He was Prime Minister for the short period of Dec. 1932-Jan. 1933, when his gov. fell over a minor financial question. Under the leadership of Blum he was in 1933, and again in 1938, Minister for Foreign Affairs, when his policy was to secure collective security in Europe. He headed the Fr. delegation to the United Nations Assembly in Jan. 1946.

**Paul of Samosata** (fl. 3rd cent. AD), heretical teacher, b. at Samosata in Commagene. About 260 he became Bishop of Antioch, where he also acted as vice-regent to Zenobia, the Queen of Palmyra. He taught the Monarchian heresy (see MONARCHIANISM) that God is one, and that the Trinity is only a name

for the 3 forms in which God has expressed Himself. In 264 Paul's teachings were condemned at the Council of Antioch, and 5 years later he was deposed. But he was supported by Zenobia, and continued to retain his position until the city was taken by the Emperor Aurelian in 273. Followers of P. of S. existed as late as the 4th cent. See C. G. A. Harnack, *History of Dogma* (vol. iii.), 1894.

**Paul the Deacon** (Paulus Diaconus, known also as Warnefridus) (c. 720-991), a Lombard, b. in Friuli, who became a monk in the monastery of Monte Cassino. He wrote *Historia gentis Langobardorum Libri VI*, dealing with the period from 568 to 744, as well as other works of importance in the hist. of monasticism. His *Historia romana* is a sequel to the *Breviarium* of Eutropius.

**Paul Veronese**, see under VERONESE, PAUL.

**Paulding, James Kirke** (1778-1860), Amer. author, b. Pleasant Valley, New York. Self-educ. and early developing a taste for writing, he was a friend of Washington Irving, and wrote a portion of *Salmagundi*. During the war of 1812 he pub. the *Diverting History of John Bull and Brother Jonathan*; in 1813 a parody of the *Lay of the Last Minstrel*, entitled *A Lay of the Scottish Fiddle*; and in 1814 a more serious work, *The United States and England*, a defence against articles in the *Quarterly Review*. This work attracted to him the attention of President Madison, and caused him to be appointed a member of the Board of Naval Commissioners. In 1817 he pub. a defence of the S. states and of slavery in *Letters from the South, by a Northern Man*. His numerous other works include *Königsminne*, a novel, 1825, *Merry Tales of the Three Wise Men of Gotham*, 1826, *The New Pilgrim's Progress*, 1828, *Tales of a Good Woman*, 1829, *Book of St Nicholas*, 1830, *The Dutchman's Fireside*, 1831. These were followed by *A Life of Washington*, 1835, and *Slavery in the United States*, 1836, in which the institution is defended on social, economical, and physiological grounds. Later he was appointed secretary of the navy.

**Paulet, or Powlett, Charles**, see BOLTON, DUKE OF.

**Pauli, Wolfgang** (1900- ). Swiss physicist, b. Vienna. Since 1928, prof. at Swiss Federal Institute of Technology, Zürich. He studied at Munich with Sommerfeld. As a student he wrote the article 'Theory of Relativity' for the *Mathematical Encyclopædia*, still one of the best presentations of the subject. He worked on Niels Bohr's interpretation of atomic spectra in terms of quantum theory, and made further discoveries which served Bohr as the main factor in his explanation of the periodic system of the elements. His Exclusion Principle does not permit a plurality of electrons to occupy the same energy level, or more accurately to possess the same quantum numbers. P. also had a share in the development of matrix mechanics. In 1945 he was awarded the Nobel prize for physics. He has pub. papers on nuclear physics, equilibrium of radiation and

molecules, entropy in quantum statistics, and similar subjects. Pub. *Meson Theory of Nuclear Forces*, 1946.

**Paulicians**, heretical sect which arose in Syria and the E. during the 7th cent., and whose beliefs were a blend of Manichaeism and Gnosticism (qq.v.). The name is generally said to be derived from the apostle St Paul, for whose writings the sect had an especial veneration. The P., who themselves refused to accept any title but 'Christians,' underwent severe persecutions from the E. emperors, and they are said finally to have died out in the reign of Alexius Comnenus. The Bogomils, Cathari, Albigenes, etc., are their spiritual descendants, and in Armenia P. communities continued till recent years. See C. A. Scott, article 'Paulicians' in Hastings's *Encyclopædia of Religion and Ethics* (vol. ix.), and C. G. A. Harnack, *History of Dogma* (vol. ii), trans. 1895-6.

**Paulinus, St** (d. 644), first Archbishop of York. A Roman by birth, he became a monk and was sent out in 601 by Gregory the Great as auxiliary to St Augustine. He laboured as a missionary first in Kent and then in Northumbria, where he had accompanied Ethelburga, daughter of the Kentish king, Ethelbert, on her marriage with King Edwin, and was responsible for the rapid evangelisation of the country. But when Edwin was killed P. fled to Kent, where he became Bishop of Rochester, and the Northumbrian church he had founded virtually ceased to exist.

**Paulinus, Gaius Suetonius**, Rom. governor of Britain AD 59-62. He subdued the rebellious Iceni and defeated Boadicea (q.v.) in 61. In 66 he became a consul, and in 69 was a general in Otho's wars against Vitellius.

**Paulinus of Nola, Meropius Pontius** (c. 353-431), priest and poet, b. Bordeaux, son of the Rom. praetorian prefect in Gaul. Prefect of Rome for a time, he went to Spain, became a Christian (c. 390), and later Bishop of Nola in 409. Some of his letters, and most of his poems, are extant, showing fluency and high quality of writing. His complete works, ed. by W. Hartel, are printed in vols. 29 and 30 of the *Corpus Scriptorum Ecclesiasticorum Latinorum* (1894).

**Paulus, Julius** (fl. 3rd cent. AD), distinguished Rom. lawyer, of the circumstances of whose birth little is known. He worked as a jurist in the reigns of Septimius Severus and Antoninus Caracalla, and was legal assessor to Papinian (q.v.), upon whose works he wrote a commentary. About one-sixth of Justinian's *Digest* consists of extracts from P.

**Paulus, Lucius Aemilius**, Rom. general; consul in 219 BC, and again in 216, when he perished at Cannae. His more famous son, who bore the same name, was consul for the first time in 182 BC. During his second tenure of office, in 168, he won a decisive victory at Pydna over Perseus, King of Macedonia, and was granted the title Macedonicus. P. d. in 160 BC; and it was on the occasion of his funeral games that the *Adelphi* of Terence was first staged.



**Paulus Aegineta** (625-90), Gk physician, b. in Aegina. He was connected with the medical school of Alexandria. He was particularly skilled in surgery and gynaecology. His chief work, an encyclopaedia of medicine in seven books, went through numerous eds. and trans. (see Eng. trans. by F. Adams, 1844-7).

**Paumann, Conrad** (c. 1410-73), blind Ger. organist, see GERMAN (AND AUSTRIAN) MUSIC.

**Paupers**, see MENDICANCY; **POOR LAW**; VAGRANTS.

**Pausanias** (d. 470 BC), Spartan gen. son of Cleombrotus and nephew of Leonidas. In 479 BC the Spartans allied with the Athenians against the Persians, and placed P. in command. At the battle of Plataea the Persian forces were routed, and P. is said to have acquitted himself with great valour. He continued the war against Persia in 478, and aimed at becoming tyrant over the whole of Greece. To bring this about it was necessary to gain the support of the Persian king, and he conducted a treasonable correspondence with Xerxes. His perfidy was discovered, and he was starved to death as a punishment, by order of the ephors.

**Pausanias** (fl. 2nd cent. AD), celebrated Gk traveller and geographer, probably a native of Lydia, and there is evidence to show that he had lived long near Mt Sipylus. Of his personal hist. little is known, but passages in his great work, a *Periegesis* or *Itinerary of Greece*, show him to have been a contemporary of Antoninus Pius and M. Aurelius. See the edition with trans. by Sir J. G. Frazer (6 vols., 1898). See also Sir J. G. Frazer, *Pausanias and other Greek Sketches*, 1900.

**Pavan**, a dance of the late Renaissance, of uncertain but probably It. origin (the It. name *padovana* suggests that it came from Padua), with some connection, however, with the Fr. *basse-danse*. It is nearly always in slow common time, though P.s in triple rhythm are not unknown. As a musical composition it was as a rule paired with another and more lively dance, the galliard (q.v.), which was in triple time. The same tune was sometimes used, rhythmically transformed.

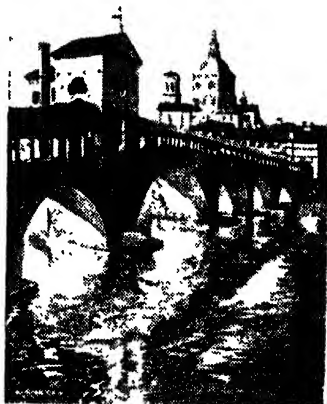
**Pavello, Ante**, see CROATIA.

**Pavese, Cesare** (1908-1950), It. novelist, b. Cuneo, Piedmont. He wrote some poetry (*Lavorare stanca*, 1936; and *Verrà la morte*, 1951), but his primary importance is as a writer of novels and long short stories. His realism is mingled with intense poetic feeling and a growing sense of the vanity of human existence. P. committed suicide at the age of 42. His best work, *La luna e i falò*, 1950, was translated into many languages (Eng. trans. by L. Sinclair, *The Moon and the Bonfire*, 1952). Other novels include *La Spiaggia*, 1942; *Feria d'agosto*, 1946; *Il compagno*, 1947; *La bella estate*, 1949.

**Pavetta**, dwarf shrub with white flowers and ornamental leaves, cultivated in greenhouses. The best-known species is *P. cafra*, 3-4 ft high.

**Pavia**: 1. Prov. of Italy, in SW. Lombardy (q.v.). It is mainly a fertile plain,

but is mountainous in the S. It is watered by the Po (q.v.), and its tribs., the Ticino, Trebbia (qq.v.), Olona, and Sesia. There are numerous canals, the most important of which connects the Ticino and Olona. Silk, cheese, cattle, rice, cereals, chestnuts, fruit, and wine are produced. The princts include P. and Mortara (qq.v.). Area 1146 sq. m. Pop. 513,000.



The covered bridge over the Ticino, destroyed in the Second World War.

2. (anc. *Ticinum*; later *Papia*) It. city, cap. of the prov. of P., on the Ticino, 18 m. S. of Milan (q.v.). It was founded by the Ligurii, and became the cap. of the Longobards (q.v.) until it was taken from them by Charlemagne (q.v.) in 774. It was sacked by the Hungarians in 924, and in 1359 it was taken by the Visconti (q.v.). In 1500 it was sacked by the Fr. Charles V defeated and captured Francis I (q.v.) here in 1525, but in 1527-8 the tn was again in the hands of the Fr. It was annexed by Austria in 1714, was pillaged by Napoleon (q.v.) in 1796, and became part of united Italy in 1859. Church councils were held in the tn in 1081, 1160, and 1423. P. has still its anc. walls, and has a cathedral, begun in 1488 but not completed until 1898. The basilica of S. Michele, in which the old 'kings of Italy' were crowned, dates from the 12th cent. There is a beautiful 14th-cent. Visconti castle, and a univ., said to have been founded by Charlemagne, but formally constituted in 1361. A magnificent 14th-cent. granite bridge of 7 arches which crossed the riv. was damaged during the Second World War and collapsed; it has been replaced by a copy. 5 m. N. of the tn is the famous monastery, the *Certosa di Pavia* (q.v.). P. has a

trade in agric. produce, wine, silk, and cheese; it has also important marble works, and manufs. sewing machines. Pop. 67,000.

**Pavilion** (O.F. *pavillon* = tent), either (i) a lightly constructed building for recreation or display; or (ii) a projecting feature at the end of a classical façade; or (iii) a detached block of a hospital or sanatorium, isolated for medical reasons.

**Pavise**, see **SHIELD**.

**Pavlitza**, see **PHIGALIA**.

**Pavlodar**: 1. Oblast. (prov.) of the Kazakh S.S.R. of the Soviet Union. It bestrides the Irtysh R. and has rich mineral and chemical deposits. Wheat and millet are cultivated. Pop. 400,000.

2. Cap. of P. oblast. It has meat and tanning industries. Pop. 60,000.

**Pavlograd** (Ukrainian *Pavlohrad*), tn in the Dnepropetrovsk Oblast of the Ukraine, 40 m. E. of Dnepropetrovsk. It has some industry and there is coal mining. It was founded in 1778, and before 1917 was a centre of a lively trade in grain, cattle, and horses. Pop. (1956) 35,000 (c. 1914, 40,000).

**Pavlov**, Ivan Petrovich (1849-1936), Russian physiologist, b. Ryazan, son of a vil. priest and educ. first at a theological seminary and then in St Petersburg, in general science at the univ. and in medicine at the Military Academy. In 1891 he was made director of the physiological dept. of the newly estab. Institute of Experimental Medicine; in 1897 prof. of physiology at the Military Academy; and in 1907 one of the 4 scientific members of the St Petersburg Academy. His earliest important work was on the physiology of circulation. His next was on digestion, involving researches on conditioned reflexes, and, through them, on animal psychology. These researches reformed all ideas of the processes of digestion and were the foundation of modern knowledge of the subject. Subsequently he began to study the higher nervous activity of man, using individuals with functionally and anatomically diseased brains. On his eighty-fifth birthday the Soviet Gov., which he was always criticising, gave him a large sum for the extension of his laboratories and a pension of 20,000 roubles. He won the Nobel prize in medicine in 1904 and received the Copley Medal of the Royal Society in 1915. See also **BEHAVIOURISM**; **CONDITIONED REFLEX**. Biography by B. P. Babkin, 1951.

**Pavlova**, Anna (1881-1931), famous Russian ballerina, b. St Petersburg. At the age of 10 she entered the state-endowed Imperial Ballet School attached to the Mariinski Theatre in St Petersburg, where in 1906, having passed rapidly through all its grades, she became prima ballerina. She first danced outside Russia in 1907. In 1909 she appeared in Paris with the Diaghilev Ballet, but thereafter she danced with her own company, travelling all over the world and bringing ballet to many places which had never seen it before. She was not an innovator in the sense that those who worked with Diaghilev were, and the works in which

she danced were generally of no particular artistic value. But by her own transcendent genius as a dancer she spread the popularity of ballet much wider than did the Diaghilev Ballet, laying the foundation for the world-wide interest in ballet to-day. Her most famous dance was *Le Cygne*, which Fokine arranged for her to music by Saint-Saëns. She herself composed the choreography of *Autumn Leaves*,



E.N.A.

ANNA PAVLOVA

a ballet with music by Chopin. From 1912 her home, when she was not touring, was in Hampstead. She d. of pneumonia at The Hague, when beginning a European tour. See lives by V. Dandré (her husband), 1932, and C. W. Beaumont, 1932.

**Pavlovo**, tn in Gor'kiy Oblast of U.S.S.R., on R. Oka 40 m. SW. of Gor'kiy. It has extensive metal-working industries (autobuses, tools, cutlery, hardware), and has been known since the 17th cent. as a centre of metal-working crafts. Pop. (1928) 16,000.

**Pavonia**, genus of Malvaceae, small shrubs or herbs found in tropical America and Asia. *P. odorata* is cultivated in Indian and Burmese gardens for its

fragrant flowers. Grown in Britain as greenhouse plants are *P. intermedia*, a hybrid with white flowers, and variety *kermesina*, a dwarf with white flowers, and *P. multiflora*, 1-2 ft high, with purple flowers.

**Pavonidae, see PEACOCK.**

**Pawnbroker.** The Pawnbrokers Acts of 1872 and 1922 define a P. as one who keeps a shop and purchases or takes in goods, paying or lending thereon any sum not exceeding £10 under an agreement, express or reasonably to be implied, that the goods may be afterwards repurchased or redeemed. A P. may not act without a licence from the Inland Revenue Commissioners, the penalty for so acting being £50. Such licence, the duty on which is £7 10s., can only be obtained on production of a certificate from a magistrate. For dealing in silver a plate licence (£5 15s.) is required, and a moneylender's licence (£15) if the P. wishes to advance more than £10. Magistrates must grant certificates to applicants within their jurisdiction unless the applicant is of bad character or his shop or any adjacent premises owned by him are frequented by persons of bad character. Twenty-one days' notice of an intended application must be given by registered letter to the dist. superintendent of police, and 28 days prior to application a notice must be affixed for 2 consecutive Sundays on some church door, or, if there be none, some conspicuous public place. Pledges must be redeemed within 12 calendar months from (and exclusive of) the day of pawning (with an additional 7 days' grace). Pledges for 10s. or under if not redeemed become the P.'s absolute property. Pledges for more than 10s. must be sold by auction, and any P. may purchase at the sale. A P. must not take goods if the pawner refuses to take a ticket. If the pawner has lost his ticket or had it stolen or destroyed, he must get from the P. a form of the declaration to be made before a magistrate with respect to the missing ticket. Both the pawner and some person who can identify him as the owner of the goods or as the person entitled to hold the lost ticket must make the declaration. The form of declaration when completed and delivered back to the P. operates to put the declarant in the same position as if he had produced the ticket, and the P., unless he knows the declaration to be false, will then incur no liability for delivering the goods to him. If a pledge be destroyed or damaged by fire, the P. must pay within the redeemable period the value of the pledge less loan and profit; the value is taken to be the amount of the loan plus profit plus 25 per cent on the amount of the loan. For the ticket of goods pledged for 10s. or less the P. is entitled to charge  $\frac{1}{4}$ d. and an additional charge of  $\frac{1}{4}$ d. for each 5s. or part of 5s. lent; loans above 10s. and not exceeding £2,  $\frac{1}{4}$ d. for the ticket and the same rate of profit as above; for loans above £2, the profit of  $\frac{1}{4}$ d. per month is reckoned on each 2s. 6d. or part of 2s. 6d. unless a special contract is made and a

special ticket given in accordance with the prescribed form under the Act of 1922. A P. may not, without rendering himself liable to a penalty of £10, receive a pledge from any person appearing to be under 14 (in London, under 16) or intoxicated. A P. who takes stolen goods may find himself ordered by a magistrate to restore them to the true owner if the pawner be convicted; but the magistrate will ordinarily consider the conduct both of the P. and the owner in making any order. It is provided by the Firearms Act (1937) that a P. may not take in pawn firearms or ammunition.

The Liability for War Damage Act, 1939, provides, in the case of loss or damage of a pledge by fire due to war, that the P. is not liable to make any payment, and unless the pawner redeems the pledge he is not liable to repay the loan. This provision applies only to pledges on which a loan of £10 or less has been made. Before 1939 there were 2700 P.s in Britain; in 1949 the number had declined to 1600, including 150 in London. See also MONT-DE-PIÈTRE. See L. P. Stubbs, *Guide*, 1866; A. Hardaker, *Brief History of Pawnbroking*, 1892; L. Lallemand, *Histoire de la charité*, 1912; also *Pawnbrokers' Gazette* (weekly).

**Pawnee**, N. Amer. Indian tribe of Caddoan linguistic stock, formerly living in Nebraska. They fought much with the Dakota (q.v.) and assisted the Whites by furnishing scouts. To-day they number about 1000 in a reservation in Oklahoma.

**Pawpaw**, *Asimina triloba*, family Annonaceae, a deciduous tree of SE. U.S.A., which is cultivated for ovoid melon-like fruit, with yellowish, sweet pulp, in temperate regions.

**Pawtucket**, city of Providence co., Rhode Is., U.S.A., 6 m. N. of Providence, and near the city of Central Falls. It lies on both sides of P. R., which is navigable below the falls, and covers an area of about 10 sq. m. The chief industries are the manuf. of textile cottons, silks, braids, hosiery, machinery, and metal, paper, and wood products; there is also textile bleaching and dyeing. The first U.S.A. cotton factory was estab. here in 1790. Pop. 81,436.

**Pax Augusta, see BADAJOZ.**

**Pax Julia, see BEJA.**

**Pax Romana**, abstention from war enforced on states subject to the Rom. Empire. The orderly administration of justice and the universal peace, which the Rom. Empire estab. from the Atlantic to the Euphrates, did not, however, survive the inroads of the Teutonic tribes who in W. Europe apportioned the inheritance of the Lat. *orbis terrarum* between them. Rom. power had become weakened by Julius Caesar's time, but the Gallic conquest added to the ageing body of the Rom. state a limb which contributed largely to the renewal of its youth; for Caesar himself laid the foundation of Rome's monarchical power, and in the world's hist. it played a part of incomparable importance simply by the fact that the current of the Germanic invasion into the Rom. Empire was thereby

dammed at a time when the Germanic world could have shattered Rom. and, with it, classical civilisation, but could not have absorbed it.

Augustus gave Rome 50 years of peace and good government, and he estab. a form of empire which was destined to endure for many years. But all the early Teutonic codes, being based, however remotely, on the right of private war and private vengeance, might deter but could not eradicate the instinct which urges the members of semi-civilised communities to avenge their own wrongs. Hence the P. R. died with the empire, and the able organisation of Charlemagne could effect no more in the W. half of the empire than a very partial resuscitation (*see also under* GOD'S TRUCK). Pax Britannica has the same connotation in relation to the Brit. Empire (q.v.).

**Pax Romana**, Rom. Catholic organisation devoted to the maintaining of contacts between univ. students and to promoting moral and social welfare through their influence. It was founded in 1921 by students and undergraduates of 18 nations at Fribourg in Switzerland. Since then it has grown to world-wide extension by affiliating existing organisations. In 1946 it was divided into a senior or graduate branch and a junior branch. In England the Newman Association and the Union of Catholic Students are respectively the senior and junior Brit. constituents of these branches.

**Paxo**, smallest of the 7 chief Ionian Is., 10 m. SSE. of Corfu. Its length is  $6\frac{1}{2}$  m. and its breadth 2 m. The surface is mountainous, and it produces olives, almonds, and vines. Cap. Galos, on the E. coast. Pop. of is. 3000.

**Paxton**, Sir Joseph (1801-65), gardener and architect, b. Milton Bryant, Bedfordshire. While serving as a gardener, attracted the attention of the Duke of Devonshire, who in 1826 appointed him superintendent of the gardens at Chatsworth. He designed the building for the great exhibition of 1851, and 2 years later removed the glass and iron structure to Sydenham, where it was called the Crystal Palace. He represented Coventry in Parliament from 1854 until his death. He wrote sev. horticultural works, including *A Botanical Dictionary of all Plants known in Britain*, 1868.

**Pay As You Earn**, *see* INCOME TAX.

**Payerne** (anc. Paterniacum), small tn of Switzerland, 10 m. W. of Fribourg, in the canton of Vaud. Pop. 5500.

**Paymaster**, in navy, *see* PURSER.

**Paymaster-General**. The office of P.-G. was reorganised in 1836, the various offices of paymaster of the army, navy, ordnance, and civil service being by that Act consolidated into one office. To this office are now paid all the public moneys due for the army, navy, air force, and civil services. The issue of money for the Consolidated Fund services is made by Treasury requisition to the comptroller and auditor-general; and when the latter, being satisfied that the requisition complies with Acts governing the proposed expenditure, makes the necessary order,

the Treasury directs the Bank of England to transfer the sums required from the Exchequer account to that of the P.-G. Similarly, requisitions for credit are made by directions from the Treasury to the bank to transfer the sums specified to the 'supply account' of the P.-G. The depts concerned are then informed that the sums voted by Parliament are placed to their respective accounts with the P.-G., and from that moment they become responsible for their disbursement in accordance with the votes. The office is unpaid. *See* Sir W. R. Anson, *Law and Custom of the Constitution*, 1886-92.

**Payn, James** (1830-98), novelist, b. Cheltenham. He began his literary career when, as a Cambridge undergraduate, he pub. in 1852 2 vols. of verse. He then became a contributor to *Chambers's Journal*, of which he was editor from 1859 to 1874. From 1883 he was editor of the *Cornhill Magazine* until within 2 years of his death. His first novel, *The Foster Brothers*, appeared in 1859, and had some scores of successors, including *Lost Sir Massingberd*, 1864, *Walter's Ward*, 1875, *By Proxy*, 1878, *The Canon's Ward*, 1884, and *The Talk of the Town*, 1885. Most of P.'s stories are sensational or have an element of mystery in them, and, though the chain of coincidence is often strained, the plots are usually ingenious and well worked out.

**Payne, John Howard** (1791-1852), Amer. actor and dramatist, b. New York. His first appearance on the stage was in Home's *Douglas*, in which he at once achieved success. In 1813 he appeared in London, estab. himself in England, and had a successful career both as actor and author for upwards of 30 years. He wrote *Clari, or the Maid of Milan*, 1823, containing the well-known song, 'Home, Sweet Home,' *Charles II*, 1824, and others, and adapted plays from the Fr. *See* G. Harrison, *The Life and Writings of John Howard Payne*, 1885, and W. T. Hanson, *The Early Life of John Howard Payne*, 1913.

**Paysandú**, dept. of Uruguay, with an area of 5117 sq. m., and an important cattle industry. Wine is produced and the dept is rich in minerals. The city of P., on the Uruguay R., is the cap. of the dept of P. and the second city in the republic. It is accessible from the ocean. There are large slaughter-houses, and tinned meat and tongue are exported. P. is the centre of the meat-preserving industry. Other activities are breweries, distilleries, tanneries, sugar refineries, shoe and soap factories. P. is the headquarters of the Midland Railway. The city is being modernised. By rail it is 300 m. N. and then W. from Montevideo (q.v.). Pop. (dept) 90,000; (city) 60,000.

**Paz, La**, *see* LA PAZ.

**Paz Soldán, Mariano Felipe** (1821-86), Peruvian historian and geographer, b. Arequipa; studied and later practised law there and at Lima; in 1860 he became director of public works. He wrote *Atlas Geográfico del Perú*, 1861; *Historia del Perú independiente*, 1868; *Diccionario geográfico estadístico del Perú*, 1877; and *Historia de la guerra del Pacífico*, 1884.

**Pazand, or Avesta, see PERSIA, Language and Literature.**

**Pea.** Two species of *P.s.* are cultivated in Britain, and of both there are a large number of varieties. The garden *P.* (*Pisum sativum*) is not known to exist in a wild state; its flowers are white, and its seeds are yellowish-white or bluish-green. They are gathered unripe and eaten as green *P.s.*, one of the most nutritious and popular vegetables. The earliest crops are raised from seeds of forcing varieties sown in gentle heat in Dec. The earliest



A, garden pea; B, sugar pea.

outdoor plants are raised from seed sown under glass in Feb. and planted out in Mar. or April. The field *P.* (*P. s.* variety *arvense*) has purplish flowers, and is harder than the garden *P.* It is, however, a very uncertain farm crop, doing best on light land rich in lime; it follows barley in a rotation. The dry straw or haulm averages about a ton per acre, and is used as fodder. The variety known as the sugar *P.* has an edible pod.

**Peabody, George Foster (1795-1869),** Amer. philanthropist, b. Danvers (now Peabody), Massachusetts, U.S.A. Having amassed a fortune as a dry goods merchant, he settled in England in 1837, where he continued in business. He gave largely to educational institutions, and was a lavish donor to Harvard and Yale. He is principally remembered in England for his gifts to the London poor, amounting in all to half a million sterling. Out of this sum were built the 'P. Dwellings', the first of which was opened in Spital-fields in 1864. A retiring man, he declined a baronetcy and the G.C.B. In 1866 he estab. a museum of archaeology and ethnology at Harvard and of natural hist. at Yale. In 1940 there were estab. in his memory radio and television awards for meritorious service by broadcasters.

**Peabody, city of Massachusetts, U.S.A.,** in Essex co., 17 m. NE. of Boston, with

leather industries. Formerly S. Danvers, in 1868 it was renamed after George Peabody (q.v.), who was a native. Pop. 22,645.

**Peace, Charles (1832-79),** criminal, b. Sheffield, where he received his first sentence for robbery in 1851. Before his execution at Leeds on 25 Feb. 1879, for the murder of Arthur Dyson on 29 Nov. 1876, he confessed to many burglaries and to the murder of a policeman at Manchester in 1876.

**Peace, Breach of, see BREACH.**

**Peace, Clerk of the, see CLERK OF THE PEACE.**

**Peace, Commission of, see JUSTICES OF THE PEACE.**

**Peace Ballot,** unofficial referendum on the subject of peace or war sponsored by the League of Nations Union in 1935 to test public opinion on 4 specific questions, the public being asked to reply 'Yes' or 'No' to each: whether they were in favour: (1) of the League of Nations; (2) of all-round disarmament; (3) of the private manuf. of arms; and (4) (a) of economic and (b) military action against an aggressor nation. The total of papers returned was 11,640,066, and exceeded the most sanguine expectations of the organisers. The vast majority of the answers to most of the questions were in the affirmative, the largest number of negative answers being to question (4) (b) 2,366,184, and to question (3). The moving spirit in the ballot was Lord Robert Cecil (q.v.). The announcement came at an opportune moment, for Brit. attachment to the ideals of the League of Nations was soon to be put to the test over the Italo-Ethiopian crisis.

**Peace Conference.** For P. Cs before the First World War, see HAGUE CONFERENCE. For P. Cs after the First World War, see PEACE CONFERENCE (1919); LOCARNO CONFERENCE AND TREATIES; also COVENANT OF THE LEAGUE OF NATIONS. For P. Cs after the Second World War, see EUROPE. History; and see history sections of articles on countries concerned.

**Peace Conference (1919),** assembled on 18 Jan. 1919 in Paris. There were 70 delegates representing 30 states. Great Britain, the U.S.A., France, Italy, and Japan sent 5 delegates each, Belgium, Brazil, and Serbia 3 each, and the remainder 2 or 1. After the formal opening, the conference sat but rarely, its sessions being largely ceremonial. The actual work was carried on by special committees which discussed such individual topics as the 'league of nations', 'reparations', 'war responsibility', 'labour legislation', etc. The committees sat *in camera*, and only such reports as were approved by the spokesmen of the Great Powers were submitted to the plenary conference. Originally there was a Council of Ten, constituting the Supreme Council; this was reduced to 5 and then, after Japan dropped out, to 4—Wilson, President of the U.S.A., Clemenceau, Lloyd George, and Orlando of Italy. Then Italy withdrew over the Fiume question and the council was reduced to the 'Big Three.'

Differences of outlook were hard to reconcile. Wilson's main preoccupation was with his project for a league of nations, while Great Britain was concerned chiefly with the supremacy of the seas and the control, through the mandatory system, of the Ger. colonies. The principle of self-determination proved a thorn in the settlement of boundary disputes, notably as between the Balkan states, Poland and the Ukraine, the Poles and the Czechoslovaks, and Italy and Yugoslavia. France held strong views on her rights to economic privileges in Germany and special political and financial privileges in the Saar valley. A proposed defensive alliance between Great Britain, France, and the U.S.A., contrary to the earlier pronouncements against alliances within the league, was also one of the causes of delay. In the result, President Wilson, rather than incur possible opposition to his League of Nations, gave way on such of the above questions as were really opposed to his ideals; but even though the It. delegates seceded for a time, he refused to yield to the It. demand for the cession of ter. guaranteed to Serbia by various secret treaties. Difficulties also arose over a territorial settlement in the Pacific, owing to the traditional conflict of interests between Australia and New Zealand on the one hand, and Japan on the other. But after some 4 months of deliberations, the allied diplomatists submitted the draft of the proposed treaty with Germany to the Council, and this draft was accepted by the P. C. in plenary session on 6 May. On 7 May the P. C. having become the Peace Congress, at which Germany was to be represented, the draft was handed to Count Brockdorff-Rantzau, the Foreign Secretary of the Ger. rep. at Versailles, and accepted, though only after protests and a political crisis in Germany, unconditionally on 23 June, the last day of grace. After the treaty was ratified, further conferences were held at San Remo, The Hague, and Spa in April, May, and June 1920 respectively, to discuss reparations, disarmament, mandates, and the Adriatic question. For Peace Conference with Turkey see under LAUSANNE.

*Sequel to the Peace Settlement of 1919-1920.* The peace settlement of 1919-20 was ill calculated to promote peace even for a limited period. The new co-operative system embodied in the League of Nations was stultified from the start by the defection of its protagonist's (Wilson's) country and by the fact that it was not sustained by the organised opinion of the nations as a whole. There were grave inherent imperfections in the treaty of Versailles, not the least of which was the lack of large-scale economic planning. The severity of the treaty struck the weak Weimar Republic a mortal blow, for in Ger. opinion it identified democracy with humiliation. Moreover, the French, under the lead of Clemenceau, were dissatisfied with the peace settlement, which, in their view, afforded them no real security because of the Anglo-Amer. veto on the separation

of the l. b. of the Rhine and on the Fr. annexation of the Saar. France, too, regarded the League of Nations as an Anglo-Amer. creation, and therefore reposed no confidence in its practical utility in time of need. The League membership seemed to show that the body was merely a perpetuation of the victorious allied and associated powers (minus America), involving the sharp div. of Europe between the satiated and the hungry, or the 'Haves' and the 'Have-nots.' As a fully satisfied power it was natural for the Brit. Empire to welcome the experiment of the League and its Covenant as a stabilising influence in the world offering, through the machinery of collective security, a way of escape from 19th-cent. isolationism on the one hand and, on the other, from provocative alliances like the Anglo-Fr. *entente* and the Brit. alliance with Japan. Thus the 'peace settlement' contained the seeds of a new conflict and the peace was lost as soon as the military victory was won. It has been said with truth that there were only two ways of averting another contest: the first was the path of reconciliation implicit in the Fourteen Points (q.v.) and outlined in Lloyd George's memorandum 25 March 1919; the rival policy, favoured by most Frenchmen, consisted in depriving Germany of the means of aggression. The first would have involved admitting Germany to the League of Nations soon after the foundation of that body, fixing reparations (q.v.) at an amount capable of being paid within a generation, the fulfilment of Article VIII of the covenant concerning disarmament, and the return of some colonial ter. under mandate. During the Locarno quinquennium it seemed as if France were converted to the policy of reconciliation, but the change was only superficial. Locarno was a failure, not necessarily because it was based on unsound principles, but because it was not implemented by larger measures of conciliation. The Locarno treaties, though they had their origin in Germany, were never more than an illusion, for Russia necessarily looked upon them as a one-way arrangement designed to stabilise the W. while leaving the E. open to Ger. attack. Through the two decades between the two world wars the theory of the balance of power was never abandoned and, rightly or wrongly, Germany regarded the Franco-Russian Treaty of 1933 as a violation of the Locarno settlement. Briand's scheme for a European federation, outlined at the League Assembly of 1929, provoked much discussion, but was soon dropped, for the states and peoples had too little confidence in one another to co-operate systematically in great affairs. The various pacts and protocols, and treaties of mutual assistance drafted from time to time at Geneva, were regarded by many as likely to revive the old system of military alliances and therefore as being contrary to the spirit of the covenant; while the much-advertised Kellogg Pact, which declared that the signatories were not debarred from the right to defend themselves against unprovoked attack,

was thereby reduced to the level of a pious assertion. The optional clause (q.v.) referring disputes to the permanent court of international justice, was futile, for the signatories pledged themselves only to the submission of legal or treaty disputes, thereby excluding many of the most inflammable problems. Disarmament proved a snare, for no one could foresee, after the Washington treaties, which were promptly described by Balfour as an unmixed benefit to mankind, that Japan would before long abandon her conciliatory mood, resume her expansionist drive, and repudiate her treaty obligations. France, following the repudiation of Wilson by Congress in 1920, concluded agreements with Belgium in 1920, Poland in 1921, and Czechoslovakia in 1924, and then looked in vain to Curzon for a new military alliance with England. In 1934, when France, alarmed by Hitler's armament estimates, broke off discussions with Germany, disarmament was dead. The subsequent rearmament of Germany, the It. invasion of Abyssinia followed by a vacillating policy of sanctions by Britain and France, the dispatch of Italo-Ger. troops to Spain to support Franco, and renewed Jap. aggression in China, were in effect the beginnings of a new world conflagration. The attempt to organise the world was, however, again made after the end of the Second World War, in the United Nations Organisation (q.v.).

See L. F. L. Oppenheim, *The Future of International Law*, 1921; A. P. Fachiri, *Permanent Court of International Justice*, 1925; H. A. L. Fisher, *The Pacification of Europe*, 1925; A. Chamberlain, *Peace in Our Time (1913-27)*, 1928; T. Baty, *Canons of International Law*, 1930; Lord Riddell, *Diary of the Peace Conference*, 1933; J. A. Salter, *The United States of Europe*, 1933; G. Schwarzenberger, *The League of Nations and World Order*, 1936; and P. Mantoux, *Les délibérations du conseil des quatre*, 1955.

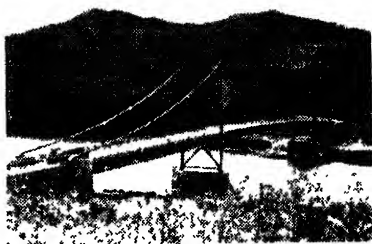
**Peace River**, tn in Alberta, Canada, 320 m. NW. of Edmonton, a junction for transport to the N. in rich, wheat-growing country. It has long been the centre of the fur trade. The tn, which takes its name from the river, was first visited by Sir Alexander Mackenzie when on his way to establish fur-trading posts for the North-West Co. and to find a way to the Pacific Ocean in 1792. The famed Alberta Tar Sands, now being developed for commercial use, are located close to the tn. Its industries are farming, fur trading, oil, lumbering, and dairy products; the climate is favourable for the cultivation of excellent fruit and vegetables. Pop. 2200.

**Peace River**, riv. of W. Canada, rising in the Rocky Mts, near 55° N. Brit. Columbia. It flows NE., receiving the drainage of Lake Athabasca, and finally empties its waters into the Great Slave Lake, being for the last 120 m. called Slave R. The dist. drained by it is usually known as the P. R. dist. Its length is estimated at 1100 m. See F. H. Kitt, *Peace River Country*, 1927.

**Peace Treaties:** 1. *First World War*.

Treaty of Brest-Litovsk, between Russia and Germany, 3 Mar. 1918; preliminary peace between Rumania and Central Powers, signed at Bucharest, 5 Mar. 1918, and ratified 7 May 1918; annulled at Versailles, 1919; treaty of Versailles signed by the Allies and Germany 29 June 1919, ratified in Paris 10 Jan. 1920; treaty of Saint-Germain-en-Laye, between Allies and Austria, signed 10 Sept. 1919, ratified at Paris, 16 July 1920; treaty of Trianon, between Allies and Hungary, signed 4 June 1920; treaty of Neuilly, between Allies and Bulgaria, signed 27 Nov. 1919, ratified in Paris, 9 Aug. 1920; treaty of Sèvres between Allies and Turkey, signed 10 Aug. 1920 (never ratified); treaty of Lausanne, between Allies and Turkey, signed 24 July 1923, ratified in the autumn of 1923 (for clauses see individual heads).

2. *Second World War*. Treaties between the Allies and Ger. satellites were signed and ratified in 1947, namely with Italy, Hungary, Rumania, Bulgaria, and Finland (the U.S.A. was not at war with the last of these), having been drafted by Britain, America, Russia, and France. An Austrian peace treaty was signed by the same 4 powers in 1955, after sev. years of protracted negotiations caused by differences between the Russian and W. attitudes.



National Film Board, Canada

PEACE RIVER BRIDGE ON THE ALASKAN HIGHWAY, AT THIRTY-FIVE-MILE POST

**Peach**, luscious fruit of *Prunus persica*, a tree (family Rosaceae) which was introduced from the E. to S. Europe early in the Christian era and to Britain in the 16th cent. The P. and the nectarine, a smooth-skinned variety, are again being grown in the open air, but the bulk of the market supply is grown under glass, where temps. of 45° at night and 55° by day are sufficient until the fruit has stoned, when it may be raised 10°. For the production of fruit by June the trees are started in Dec.; they are sometimes trained on walls and sometimes on wire frames. Both soil and atmosphere must be kept moist through the growing season. Outdoor

\* Y

culture on walls facing S. with proper management is successful in S. England. The early bloom and growth need shelter from spring winds and frosts by means of a coping fixed near the top of the wall over the trees, light canvas or other material being suspended from it during frosty nights. Planting is best done in the autumn in soil only moderately rich, but containing lime. P.s were introduced into N. America by European settlers, and are now extensively cultivated. The P. reaches its highest perfection in the middle states; they are grown in orchards like apples. See NECTARINE.

**Peacham's Case**, the case of Edmund Peacham, rector of Hinton St George, Somersetshire, who was convicted in 1615 of high treason for having written a sermon which made seditious reflections on the Crown and gov., but which had neither been printed nor pub. Peacham had been prosecuted in the high commission court for a libel on his bishop and on the consistory court and sentenced to be deprived of his orders. Pending that prosecution his house was searched, apparently for papers connected with the alleged libel, and the officials happened to find a MS. treatise in the form of a sermon, together with some loose sheets containing, in very offensive language, such an attack on the personal conduct of the king and the actions of his ministers as would, if pub., have amounted to a seditious libel. The king and his council eventually decided to proceed against him for treason under the statute of Edward III (*see* TREASON) in 'compassing the king's death.' James directed Bacon, then attorney-general, to confer with the judges of the king's bench to ascertain, and no doubt influence, their opinion. Chief Justice Coke objected to this mode of taking judicial opinions as contrary to the custom of the realm. The servile puisne judges, however, did not hesitate to give an opinion favourable to the Crown. Coke gave an equivocal written opinion: of the two grounds for questioning the treasonable nature of the sermon, first, that it had never been pub., secondly, that even if it had, it did not amount to treason, Coke appears to have passed over the first, but boldly asserted that no mere declaration of the king's unworthiness to govern amounted to treason. P. was brought to trial at Taunton assizes, convicted, and sentenced to death. He was not, however, executed, but died in jail 7 months later.

**Peacock, Thomas Love** (1785-1866), novelist and poet, b. Weymouth, son of a glass merchant, Samuel P., of London, who d. when the boy was 3. His mother was Sarah Love, daughter of a master in the navy, a woman of strong character, who sympathised with her son's literary aspirations. He pub. a vol. of poetry, *The Monks of St Mark*, in 1804, and another, 2 years later, *Palmyra*. In Wales, where he lived 1810-11, he met his future wife, Jane Gryffyth, whose personality he is said to have adumbrated in his fragmentary romance, *Sir Calidore*. He pub. more poetry, including *The Philosophy of*

*Melancholy*, 1812, and in 1814 produced a satirical ballad, *Sir Proteus*. He became friendly with Shelley, who assisted him with money. His novels of this period were *Headlong Hall*, 1816, *Melincourt*, 1817, and *Nightmare Abbey*, 1818. These with *Sir Calidore*, are brilliant prose extravaganzas, and full of humorous dialogue and situations; but, while they secured a certain vogue, they were not productive of much profit. In 1819 he was given an appointment in the India Office, which made him independent. Just prior to this he had nearly completed his romance *Maid Marian*; its delayed pub. (1822) led

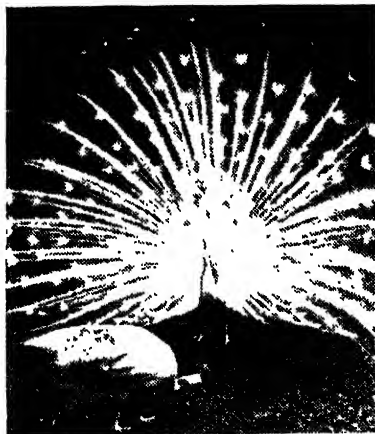


T. L. PEACOCK

to the supposition that he had plagiarised Scott's *Ivanhoe*, but in fact it was written before that work. It was dramatised in Planché's opera libretto of the same title (music by Bishop). P. seems to have shown marked ability in his official capacity, particularly in drafting official papers. His official work interfered somewhat with his literary labours; but in 1829 he pub. *The Misfortunes of Elphin*, which travesties the Reform Act under the guise of anct Welsh hist., and in 1831 *Crotchet Castle*. His last novel was *Gryll Grange*, 1861. His short novels (*Headlong Hall*, *Nightmare Abbey*, and *Crotchet Castle*) are unique in form and content in Eng. literature. Many of the leading figures of his day—Coleridge, Shelley, Byron, Canning—are the butts of his good-humoured Aristophanic satire. In each the scene is laid in the country house of some *parvenu* Maecenas, who gives a house party at which a number of ill-assorted and violently opposed intellectuals drink and gormandise while wrangling with one another in a witty disputatious symposium. Interspersed in the dialogue are many delightful lyrics and snatches of verse, largely of a convivial



strain, and indeed here may be found some of the finest drinking songs in the language. The 'Headlong-up-Headlong' chorus in *Headlong Hall* and 'If I drink water while this doth last' in *Crotchet Castle* are excellent examples of a now vanished form, while *Cypress's* (Byron) song in *Nightmare Abbey* ('There is a fever of the spirit') is as Byronic, in the best sense, as anything Byron himself wrote. P.'s works, all too little read, give abundant evidence of a strong personality, and of gifts of humour and satire. He is described by Sir Edward Strachey as 'a kind-hearted, genial, friendly man, who loved to share his enjoyment of life with all around him, and self-indulgent without being selfish.' The standard ed. of P.'s works is the *Hallford*, ed. in 10 vols. by H. F. B. Brett-Smith and C. E. Jones, 1924-34. There is also an ed. of his novels by D. Garnett, 1948. See lives by C. van Doren, 1911; J. B. Priestly, 1927; B. T. L. Cellini, 1937; and O. Campbell, 1953. See also A. M. Freeman, *Thomas Love Peacock: a Critical Study*, 1911, and A. H. Able, *Meredith and Peacock: a Study in Literary Influence*, 1933.



Mirrorpic

WHITE PEACOCKS

**Peacock, or Peafowl** (*Pavo*), small genus of beautiful gallinaceous birds. The common P. (*P. cristatus*) is a native of India and Ceylon, in parts of which P. shooting is a recognised sport. It is bred to a small extent in France for the production of the feathers. The flesh of young birds is white and resembles a pheasant's in flavour, but though formerly much valued as a table delicacy is now rarely eaten; the eggs are also edible; but it is chiefly for the beauty of the cock's plumage that P.s are kept. If enclosed they are very mischievous, and

are best given a large space containing a shrubbery, or they may not breed. The male should have 3 to 6 hens with him. The hen lays about 10 eggs in the spring, and incubation takes 30 days. She remains with her chicks 8 months, and is, therefore, the best mother for them. The male's head, neck, and breast are rich purple, and the head bears a crest of feathers webbed only at the tip. The feathers of the back are green with copper-coloured lacing; the whitish wings are striped or barred. The glossy-green feathers, ocellated at the tips, are the tail coverts, the true tail feathers being a dark rich chestnut. The female's plumage is much more subdued. The Jap. P. (*P. muticus*) is a very beautiful species, and breeds freely with the other. There is a third species, the black-winged P. (*P. nigripennis*), which is believed to be a hybrid of the common species.

**Peacock Butterfly** (*Vanessa io*), beautiful and common butterfly, measuring about 2 in. across the wings, which are a dull deep or brownish-red, and which bear each an 'eye' rather like those in the peacock's tail. The butterfly hibernates through the winter, and in early spring lays its eggs on stinging nettles; they hatch into a black and yellow caterpillar, with 6 rows of black spines and a series of white dots arranged transversely along the body.

**Peafowl**, see **PEACOCK**.

**Peak**, The, hill-country of NW. Derbyshire, England, at the southern end of the Pennine range. It lies between Manchester and Sheffield. The Peak has no fixed line of demarcation: the name covers the whole plateau north of Buxton. The greater part is now a National Park. The prin. summits are Kinder Scout (2088 ft), High Peak (1980 ft), Axe Edge (1860 ft), and Mam Tor (1700 ft). The underlying rock is millstone grit, lying in beds which dip concavely inwards from the perimeter. The moorlands are famed for their rough beauty, good walking, and grouse-shooting. Castleton is called the cap. of the Peak. The Peak cavern near by goes 500 yds into limestone. Gritstone climbing is a popular sport. The best-known climbing edges are at Laddow in the Woodhead valley, Stanage near Sheffield, the Downfall of Kinder Scout, Windgather, Castle Naze, Black Rocks, Cratcliffe Tor, and many others. See Sir W. Scott, *Peril of the Peak*, 1922; C. Porteous, *Peakland*, 1954.

**Peake**, Harold John Edward (1867-1946), archaeologist and anthropologist, b. Ellesmere. A pioneer in the investigation of the distribution of types, he early realised the close interdependence of physical anthropology and material archaeology, as may be seen from his *Beginnings of Civilisation*, 1928. P. was a member of the council of the Society of Antiquaries, 1928-30, and was awarded the Huxley medal of the Royal Anthropological Institute in 1940, for his *Study of Pre-historic Times*. His other works in this field include *The English Village*, 1922, based on his lectures at the Univ. College of Wales; *The Corridors of Time*

Series (with Prof. H. J. Fleure), 1924 onwards; *The Archaeology of Berkshire*, 1931; while his more popular works include *The Origin of Agriculture*, 1926; *The Flood*, 1930; and *Early Steps in Human Progress*, 1933.

**Peanut**, see GROUNDNUT.

**Pear**, or **Pyrus**, family Rosaceae. The European *P.* is now held to be derived from *Pyrus communis*, a native of Europe and Asia to the Himalaya; and cultivated since very early times; Pliny mentioning 39 varieties known to the Romans. *P. communis* grows wild in Britain, also *P. cordata*, often called the Celtic *P.* Cultivated *P.s* are usually grafted; standard trees on seedling *P.s*, others on dwarfing Quince stocks, for cordons, espaliers, bush, and pyramid trees. As few varieties are self-fertile, *P.s* should not be planted singly or of one variety; exception is Conference. The fruit should be gathered slightly unripe.

Alligator *P.s* or Avocado *P.s* are the fruit of *Persea gratissima*, an evergreen tropical tree. Anchovy *P.* is the edible fruit of *Grias cauliflora*, a W. Indian evergreen tree. Prickly *P.* is a name given to *Opuntia* (q.v.).

**Pearl**, Raymond (1879-1940), Amer. biologist; b. Farmington, New Hampshire. He graduated at Dartmouth, 1899, gained his Ph.D. at the Univ. of Michigan, 1902, and studied in Leipzig and London. From 1925 he was director of Institute for Biological research, Johns Hopkins Univ. He is chiefly known for his work on heredity and variation. Pubs. include *Variation and Differentiation in Ceratophyllum*, 1907; *Modes of Research in Genetics*, 1915; *The Nation's Food*, 1919; *The Biology of Death*, 1922; *Introduction to Medical Biometry and Statistics*, 1923; *Studies in Human Biology*, 1924; *The Biology of Population Growth*, 1925; *Alcohol and Longevity*, 1926; *To Begin With*, 1927; *The Rate of Living*, 1928; and *The National History of Population*, 1939.

**Pearl**, lining of the shell of many marine and fresh-water molluscs. It is a secretion laid on in a very thin coat and overlaid repeatedly so that it attains considerable thickness. It consists of calcium carbonate, with various organic matters; sp. gr. 2.5-2.7. The iridescence is partly due to the number of very thin layers and probably to the varying conditions of growth. *P.* is produced chiefly by *Aviculidae*, *P. oysters*, and the riv. mussels, *Unionidae*.

**Mother of Pearl** consists simply of the lining, which is cut out and fashioned into useful and ornamental articles, and is particularly used for inlay work. It is obtained from species and varieties of the genus *Margaritifera*, the best coming from Macassar, Manila, and W. and N. Australia. The Straits Settlements, Panama, and some Pacific is. send large quantities into the markets.

**Distribution.** The Persian Gulf, particularly round the is. of Bahrain, is especially noted for its anct and magnificent grounds. There are other fisheries in the Polynesian Is., the Sulu Archipelago, off New Guinea, W. Australia,

Queensland, Torres Strait, Ceylon, and America off Lower California. The species containing the *P.s* are *M. vulgaris*, *Avicula macroptera*, and *M. fucata*; the last-named provides the finest specimens in the Persian Gulf.

**Formation.** *P.s* are due to the attempt on the part of the mollusc to kill and rid itself of a minute worm. In the case of the Ceylon fisheries, Herdman made a complete study of the question; the parasite was a larva of a tapeworm, and the life-hist. is traced; in the free-swimming stage it attacks the oyster, which is devoured by the file-fish, the ray which feeds on this being the host of the adult form. Lyster Jameson, in the case of the common mussel, found that the pest was a trematode, the adult of which is found in the eider duck and scoter; their droppings infect the cockles and carpel shells, and these in their turn the mussels. Sand and other irritants may in some cases also be the nucleus round which the *P.s* are formed. In any case the mollusc surrounds the irritant with an excretion which solidifies into a thin layer of 'nacre,' more and more concentric layers are added, until an almost truly spherical *P.* is formed. These are found chiefly in the soft parts of the mollusc, or loose. Some are found in the shell and are hemispherical, the *perle bouton*. *Perle Baroque* is solid and not so well shaped, while *coq de perle* is hollow and covered with irregular knobs. *Fresh-water pearls* which are once again very fashionable are found in the N. hemisphere in rivs. of the temperate region; fishing was carried on in Scotland some 300 years ago, and Brit. *P.s* are mentioned by Pliny and Tacitus. *False pearls* are clover imitations; the scale of fresh-water fish is digested in ammonia and injected into thin glass balls till the film forms on the inner surface; wax or gum is then injected to give a solid interior, while the glass is removed by hydrofluoric acid. 'Cultured' *P.s* are produced by introducing into its flesh a foreign substance, which the oyster covers with nacre. For so-called cave pearls see OOLITE, and N. Casteret, *The Descent of Pierre Saint-Martin* (Eng. trans.), 1955, pp. 123, 124.

See L. Boutan, *La Perle*, 1925; J. Holman, *The Mystery of the Pearl*, 1941.

**Pearl-ash** is prepared from wood ash. The potashes are extracted by solution, evaporated out and strongly heated, thus giving a refined 'potash.' The chief constituent of *P.* is potassium carbonate,  $K_2CO_3$ . *P.* is of interest as the first drying agent for gases; it was introduced for this purpose by H. Cavendish about 1770.

**Pearl Grain**, see METEOROLOGY.

**Pearl Harbor**, inlet with a narrow entrance, about 7 m. W. from Honolulu, Oahu Is., belonging to the Sandwich or Hawaiian group in the E. Pacific Ocean. In order to protect the Pacific coast and to control the Panama Canal, the U.S.A. Gov. fortified it; important and extensive military works were constructed. The dredging of P. H. was finished in 1912, and dry docks, fortifications, as well as a naval station, constructed. The dry

dock at the naval station was officially opened in Aug. 1919. The base has 3 locks with 10 sq. m. of navigable water and hundreds of anchorages. Fords Is., on which is Luke Field, is in P. H.; Hickam Field and Wheeler Field are near by, as is Kaneohe Naval Air Station. On 7 Dec. 1941 P. H. was suddenly attacked by a large force of Jap. bombers, and great damage was done to warships, installations, etc., with considerable loss of life. Thus was America forced into the war.

*The Japanese Attack on 7 Dec. 1941.* Prior to the Jap. air attack a Jap. submarine was sighted at 6.30 a.m. in the prohibited area outside P. H. and sent

morally guilty. Hawaii, sitting behind its 'Maginot line' of the Pacific Fleet, simply reflected the over-confidence and complacency of the mainland. The reports of the army and navy boards of inquiry and statements on them by the secretaries of war and the navy were made public in Aug. 1945. The Army Board concluded that the extent of the disaster was due primarily to the failure of Gen. Walter C. Short, the army commander, adequately to alert his command; to the failure of the war dept to direct him to make an adequate alert; and to the failure to keep him sufficiently informed of developments in negotiations



*Imperial War Museum: Crown copyright*

PEARL HARBOR: DECEMBER 1941

to the bottom. Later 3 midget Jap. submarines passed unmolested into the harbour, the net across the entrance not having been closed. The air attack, carried out by small waves of planes from sev. aircraft-carriers, came from the N. Only 105 Jap. planes took part, but their attack was directed to predetermined objectives. The prin. airfields were singled out for attack. Nineteen Amer. vessels were damaged, including 6 battle-ships wrecked or sunk; combined U.S. service casualties were 3303 killed or missing and 1272 wounded.

Fifth-column treachery played a large part in the success of the Jap. attack. The official report of the Roberts Inquiry Board shows that there were some 200 agents in Honolulu alone who were acting under orders from the Jap. consul-general. The board, however, considered that the attack would have been far less damaging but for the over-confidence and complacency of the Amer. armed forces. In a sense, however, all America was

between Japan and the U.S.A. The secretary of war considered that Gen. Short's relief of command was sufficient punishment for his errors of judgment. The Navy Board found that Adms. H. R. Stark and H. E. Kimmel did not do the necessary things to prevent just such a defeat as had occurred and that they failed to demonstrate superior judgment. The secretary of the navy directed that neither Adm. Kimmel nor Adm. Stark should hold any position which required the exercise of superior judgment. Neither the secretary of war nor the secretary of the navy considered that any officer concerned with the disaster should be court-martialled, and in this they agreed with the recommendations of the boards of inquiry that nothing further should be done. See U.S. State Dept White Paper, *A Record of the Efforts for Peace and American Foreign Policy during the Fateful Decade from 1931 to 1941*; H. Fels, *The Road to Pearl Harbor*, 1951; and W. Lord, *Day of Infamy*, 1957.

**Pearl Islands**, numerous group of is. in the Bay of Panama, 40 m. S.E. of, and belonging to, Panama (q.v.). Pearl and other fisheries are carried on.

**Pearshall, Robert de** (1795-1856), musician and composer, *b.* Clifton. Besides his musical works (including madrigals and cantatas) he made a trans. of Schiller's *Wilhelm Tell*. He lived much in Germany, and his compositions and theories were influenced by the strict style of classical polyphonic composers.

**Pearse, Padraic (Patrick) Henry** (1879-1916), Irish politician and scholar, *b.* Dublin; associated from his youth with the literary side of the extreme nationalist movement and an original member of the Sinn Féin (q.v.) organisation. He founded St Enda's College, a secondary school for boys, designed for the encouragement of Irish nationalism. In 1897 he also founded the New Ireland Society. He was elected to the executive of the Gaelic League and ed. its weekly *Jour.* On the outbreak of the Easter rebellion (1916) he became commandant-general of the Irish Republican Army and president of the Provisional Gov., and he was a signatory of the declaration of the Irish Rep. After holding out for a week against the gov.'s troops, he surrendered unconditionally, was tried by court martial and executed. He was the author of poems, stories, critiques, and plays. His *Collected Works* were pub. in 2 vols. (1917 and 1918). See also J. J. Horgan, *Parnell to Pearse: Some Recollections and Reflections*, 1948.

**Pearson, Sir Cyril Arthur** (1866-1921), journalist and newspaper proprietor, *b.* Wookey, Somerset. Educ. at Winchester, he began his journalistic career by joining the staff of Sir George Newnes. Having won a competition, he secured a sub-editorship on *Tit-Bits* as a prize. He became manager of the firm; but, after remaining in this position for 4 years, left to start *Pearson's Weekly* as an independent venture. This was followed by *Home Notes*, *Pearson's Magazine*, *Short Stories*, *Ladies' Magazine*, *M.A.P.*, and *Rapid Review*. In 1900 he founded the *Daily Express*, and in 1905 he became owner of the *Standard* and chief owner of the *St James's Gazette*. In 1910 his sight began to fail, and he soon went totally blind. Thereafter, he devoted his chief energies to promoting the welfare of the blind, and founded St Dunstan's charity for blinded sailors and soldiers, 1915. In 1916 he was made a baronet, and in 1917 G.B.E. He wrote *Victory over Blindness*, 1919. See life by S. Dark, 1922.

**Pearson, Hesketh** (1887- ), biographer, *b.* Hawford, Worcestershire. He was educ. at Bedford Grammar School. In 1911 he went on the stage, and took part in various productions by Tree, Granville Barker, and George Alexander. After service in the First World War he returned to the stage, but during the next 10 years he also made a beginning in literature with the pub. of 4 books, of which *Modern Men and Manners* was the first, 1921. With *Doctor Darwin*, pub. in 1930, he entered upon the career in which he

made a wide reputation in England and America as a writer of biographies notable for their zest, humour, and power in delineating character and describing incident. These include Sydney Smith, *The Smith of Smiths*, 1934, Hazlitt, *The Fool of Love*, 1934, Gilbert and Sullivan, 1935, Labouchère, *Labby*, 1936, Tom Paine, 1937, John Nicholson, *The Hero of Delhi*, 1939, Bernard Shaw, 1942, Conan Doyle, 1943, Oscar Wilde, 1946, Dickens, 1949, and Disraeli, *Dizzy*, 1951. His autobiography, *Thinking It Over*, was pub. in 1938.

**Pearson, John** (1613-86), Bishop of Chester, *b.* Great Snoring, Norfolk; studied at Cambridge, fellow of King's College (1634-40), M.A. (1639), D.D. (c. 1660). In 1640 he became prebendary of Salisbury and rector of Thorington, and in 1645 acted as chaplain to Goring's army, the last remnant of the Royalist forces. In 1654 he accepted a charge at St Clement's Eastcheap, London, and in 1659 pub. his sermons under the title *An Exposition of the Creed*, a work of great ability and reputation. In 1660 he became master of Jesus College, Cambridge; in 1661 joint superintendent with John Earle of a trans. of the Prayer Book into Latin; in 1662 master of Trinity College, Cambridge; and in 1673 bishop of Chester. His *Minor Theological Works*, ed. with a memoir by E. Churton, were pub. in 1844.

**Pearson, John Loughborough, R.A.** (1817-97), architect, *b.* Brussels. He came to London and worked under Anthony Salvin and Philip Hardwick, and in 1843 set up independently, becoming famous as a restorer of Eng. cathedrals, including Bristol, Canterbury, Chichester, Exeter, Lincoln, and Rochester; also Westminster Abbey and Westminster Hall. His greatest new building was Truro Cathedral, 1879-87. He also designed Brisbane Cathedral; St Augustine, Kilburn; St John, Red Lion Square. many other churches, and the Astor Estate Offices, London. He was awarded the R.I.B.A. Royal Gold Medal, 1880.

**Pearson, Karl** (1857-1936), scientist, *b.* London. Educ. at Univ. College School, London, and Cambridge, where he was third wrangler. In 1882 he became prof. of geometry at Univ. College, London, and in 1885 prof. of applied mathematics and mechanics there. He was Galton prof. of eugenics in the univ. of London, and Darwin medallist of the Royal Society. His works include *Inquiries into Human Faculty and its Development*, 1883; *The Moral Basis of Socialism*, 1885; *History of the Theory of Elasticity and Strength of Materials* (with J. Todhunter), 1886-93; *Socialism in Theory and Practice*, 1887; *The Chances of Death, and Other Studies in Evolution*, 1897; *National Life from the Standpoint of Science*, 1901; *Grammar of Science*, 1902, Everyman's Library, 1937; *Tables for Statisticians*, 1914-30; *Life and Letters of Francis Galton*, 1915-25; ed. *Biometrika*, 1902-30, and *Annals of Eugenics*, 1925-30.

**Pearson, Westman Dickinson**, see COWD-RAY, VISCOUNT.

**Peary, Robert Edwin** (1856-1920), Amer.

Polar explorer and adm.; b. Cresson Springs, Pennsylvania. Entered the navy in 1881, and worked as engineer's assistant on the Nicaragua Canal. In Arctic exploration he is celebrated as the first to reach the N. pole. In 1886 he reconnoitred the ground in Greenland; in 1891-2 he spent 13 months in N. Greenland, and crossed it by sledge, a 1200-m. journey. A similar sledge journey was performed in 1893-5 in N. Greenland during a 25-month stay there. Summer voyages were undertaken in 1896 and 1897. The next journey occupied 4 years, 1898-1902, and was again spent in exploring the N. end of Greenland and its is. The *Roosevelt*, a specially built vessel, equipped with wireless telegraphy, was used in the expedition of 1905. He reached the then farthest N. in lat. 87° 6', 200 m. from the Pole—the big 'leads' and ice drift causing great trouble. He wintered 1908-9 at Cape Sheridan in the *Roosevelt*, and started on a sledge journey in the following season for the Pole; this he claimed to have reached 6 April 1909. He pub. *Northward over the Great Ice*, 1898; *Nearest the Pole*, 1907; and *The North Pole*, 1911; see also the *Geographical Journal*, Vol. 22, No. 6, 1903; Vol. 36, No. 2, 1910. He was made a rear-adm. in 1911. See lives by F. Green, 1926, J. Gordon Hayes, 1930, and W. H. Hobbs, 1937.

**Peasant Proprietor**, see METAYER SYSTEM and SMALL HOLDINGS.

**Peasantry**, term applied to rustics or countrymen, including agric. labourers and peasant proprietors, i.e. persons owning their own cottage and small amount of land. Every country has its peasants or rustic classes. See VILLEN for hist. of Eng. peasants; METAYER SYSTEM and SMALL HOLDINGS. See J. C. and H. F. Cox, *Rise of the Farm Labourer*, 1874; J. W. Robertson-Scott, *The Dying Peasant*, 1926; Eileen Power, *Peasant Life (c. 1100-1500)*, 1932; and M. E. Fordham, 'European Peasantry,' in vol. v of *European Civilisation*, 1937.

**Peasants' Revolt (1381)**. In the reign of Richard II the general distress among the poorer classes in England, following on an epidemic of the Black Death, and discontent at the enactment of a statute of labourers which attempted to prevent the peasantry taking advantage of the scarcity of labour resulting from the Black Death, came to a crisis when the poll-tax was enforced in 1379. Riots soon followed in sev. parts of England and a mob, sev. thousands strong, seized Rochester Castle and marched to Maidstone. Wat Tyler became their leader, a man of obscure origin but undoubted courage. Canterbury was seized and sacked; they then marched to London. John Ball, 'the mad priest of Kent,' joined them, having been liberated from the archbishop's prison. They continued burning and plundering, and many beautiful buildings were burnt and sacked, among them John of Gaunt's palace of the Savoy. On reaching London they seized the prisons of Newgate and Fleet. London was the scene of pillage and riot. The

boy king rode out to confer with Tyler, but with little effect. The mob then seized the Tower and murdered Archbishop Sudbury and Sir Robert Hales. Richard again went to make peace at Smithfield; Sir Wm. Walworth, the lord mayor of London, who rode with the king, killed Tyler; meanwhile the Bishop of Norwich had routed the Norfolk rebels, and the revolt was broken. See E. Powell, *Rising in East Anglia in 1381*, 1895; Sir C. Oman, *The Great Revolt of 1381*, 1906; A. Steele, *Richard II*, 1941.

**Peasants' War**. In 1524 the peasants of the Black Forest, Germany, influenced chiefly by economic distress, banded together and rose against the nobles. The revolt rapidly spread throughout the S. of the country. They demanded in 12 articles the right to elect their own ministers, to be allowed to kill wild game and to fish, and the reduction of the villein service. In Thuringia the peasants were especially successful. The army of the Swabian League, led by Philip of Hesse and encouraged by Luther, defeated them at Frankenhausen in 1525, and over 100,000 were killed, including Münzer, their leader. See E. B. Bax, *The Peasant War in Germany*, 1899, and O. H. Brandt, *Der Deutsche Bauernkrieg (1525)*, 1929.

**Peastone**, see OOLITE.

**Peat**, deposit of decaying vegetable matter in the presence of stagnant water, formed of mosses, marsh, heath, and moorland plants. In a P. bog the surface is generally covered with growing plants, while below is the decomposing matter; the deposit may be many feet deep, becoming in the lower part brown or black in colour and compact in structure; indeed, under great pressure and at high temp. coal is produced in this manner, oxygen and hydrogen being given off till little else but carbon remains. In dists. where it abounds, as in Ireland, where P. is estimated to cover one-seventh of the whole area, P. is cut into turfs, stacked to dry, and employed as fuel; but its other uses are numerous. It makes an excellent absorbent litter, has been manufactured into numerous fabrics, and from upland P. the fibrous material used in the culture of many garden plants is obtained. See also FUEL. See B. F. Haanel, *Facts about Peat*, 1924; and H.M.S.O., *The Winning, Harvesting, and Utilisation of Peat*, 1948.

**Peat Moss**, see SPHAGNUM.

**Peč (Ipek, or Petch)**, tn in Serbia, Yugoslavia, in the autonomous prov. of Kosovo-Metohija (q.v.). It is on the Bistrica, at the foot of Mt Koprivnik. In the Middle Ages it was the seat of the Serbian patriarchs, and the great monastery in which they resided, incorporating 3 churches and a chapel, remains. P. is a busy commercial tn. Pop. 21,700.

**Pecan**, or **Peccan** (*Carya pecan*), tall hickory tree, native of N. America, bearing long leaves and edible nuts of exceptionally good flavour. The shell is thin and the kernel is easily extracted.

**Peccary**, 2 species of tropical Amer. pigs, which differ from old-world swine by the presence of a strong-smelling gland

in the middle of the back, secreting a musky substance, and by the upper tusks being directed downwards instead of upwards. They have no tail and the fifth toe of the hind foot is absent. Only 2 young are produced at a birth. Adult animals are from 16 to 18 in. high and weigh from 40 to 60 lb. The collared P. (*Pecari tajacu*) extends from Patagonia to the S. border of the U.S.A. The white-lipped P. (*Tayassu pecari*) ranges between Brit. Honduras and Paraguay, where it associates in large herds which often seriously damage cultivated crops. Both P.s are pugnacious and dangerous, capable of inflicting severe bites. They are generally hunted with well-trained dogs, and after a short chase are brought to bay, when they are killed with firearms.

**Pecol**, Gioacchino, *see* LEO (popes), *Leo XIII.*

**Pechenga** (1920-45 Petsamo), settlement in Murmansk Oblast of NW. Russia, an ice-free port on Barents Sea, 75 m. NW. of Murmansk. Important nickel deposits are exploited near by. Pop. (1939) 5000. P. was founded as a monastery in 1533; in the 16th cent. it was a Muscovite foreign trade port. From 1920 to 1945 it belonged to Finland.

**Pechora**, navigable riv. in the NE. of European Russia. It rises in the Ural Mts and flows N., SW., and N. again into the Barents Sea. Length 1100 m., basin 126,000 sq. m. The chief ports are Pechora and Nar'yan-Mar. The basin is the coldest region of Europe and has the thickest snow cover; there are large coal deposits (*see* VORKUTA).

**Pechory** (Estonian *Petseri*), tn in the Pskov Oblast of NW. Russia, 25 m. W. of Pskov. It is notable for the famous Pskov-P. cave monastery, founded in 1473. Until the 18th cent. P. was an important frontier fortress. Pop. (1938) 5000, half Estonian. It belonged to Estonia 1920-45.

**Peckham**, dist. of London, near the N. of the bor. of Camberwell. The manor of P. was once the property of the Abbey of Westminster, and later of Henry I. P. was once famous for its fair. After c. 1820 it became built up and industrialised, but P. Rye Park remains unspoiled. In P. are the S. Metropolitan Gas Works, the Licensed Victuallers' Asylum, and the Pioneer Health Centre.

**Peckham Experiment**, health centre, founded as an experiment into the nature of health, as distinct from the study of either the cure or prevention of sickness, originally opened in a small house in Queen's Road, Peckham (London, S.E. 15), in 1926. A 'Family Club' was formed, and all married couples (with or without children) were invited to join, at a family subscription of 1s. weekly. More than a hundred families joined in the 3 years that this first centre was open. In May 1935 a new centre was opened in Peckham, a larger enterprise, which not only extended the previous service but also provided a new social structure to vivify the health of the member-families. The health centre was an experiment

built, equipped, and to a large degree maintained by voluntary subscriptions; lack of funds forced it to close in 1951. *See* G. Scott Williamson and Innes H. Pearce, *The Case for Action*, 1931, *Biologists in Search of Material*, 1938, and *Science, Synthesis and Sanity*; G. Scott Williamson, *Physician Heal Thyself*, 1935; Innes H. Pearce and Lucy H. Crocker, *The Peckham Experiment*, 1943.

**Pecock**, Reginald (c. 1395-c. 1460), bishop and author. He became a fellow of Oriel College, Oxford, in 1417. In 1431 he became master of Whittington College, London, and rector of its church; in 1444 Bishop of St Asaph, and in 1450 Bishop of Chichester. He was an active controversialist, most of his energies being directed against the Lollards. In 1447 he roused popular indignation by a sermon against church reform, delivered at St Paul's Cross. The extreme character of his writings brought him into disrepute with the eccles. authorities. In 1457 he was expelled from the Privy Council, of which he had been made a member, made a public abjuration at St Paul's Cross, and resigned his bishopric (1458). He retired to Thorney Abbey. In his prose he had clarity, the gift of choosing homely examples, and a wealth of words.

**Pecos**, riv. of the U.S.A., rising in NE. New Mexico, and flowing SE. and S., through Texas, to join the Rio Grande 35 m. NW. of Del Rio. Its prin. importance is as a source of irrigation, the U.S. national reclamation service having estab. projects at Carlsbad and Hondo to serve 30,000 ac. Important dams on the riv. are Alamogordo, Avalon, and McMillan. Erosion control experiments have been made. Length 926 m.

**Pécs** (Ger. *Fünfkirchen*; anc't *Quinque Ecclesiae*), city of SW. Hungary, cap. of the co. of Baranya, at the S. foot of the Meesek Mts, 105 m. SSW. of Budapest (q.v.). It dates from Rom. times, and its bishopric was founded by St Stephen (*see* STEPHEN I of Hungary) in 1009. The first Hungarian univ. was estab. here in 1367 (the present univ. was transferred from Bratislava (q.v.) in 1922). After the battle of Mohács (q.v.) in 1526 the Turks occupied the tn for more than a cent. During the anti-Russian risings of Oct.-Nov. 1956, P. was one of the centres of Hungarian resistance. There is a fine 4-towered Lombard-Romanesque cathedral (11th-16th cents., rebuilt 1891); other notable buildings include a 16th-cent. mosque, now a church. The prin. industries are the manuf. of pottery and agric. machinery, tanning, distilling, and meat-packing. Coal is mined near by, and there is an airfield. Pop. 88,000.

**Peculiar** (O.F. *peculier*, private; Lat. *peculiaris*, of private property), in Eng. law, a par. or church having jurisdiction within itself, and exempt from the jurisdiction of the ordinary, e.g. Westminster Abbey. *See also* DEAN.

**Peculiar People**, evangelical Protestant Christian denomination founded in 1838. Its churches are arranged in circuits, with ordained ministers, central presbytery, youth organisation, and Sunday school

conference. The P. P. beliefs are distinguished by belief in the plenary inspiration of Holy Scriptures, baptism of believers, Holy Communion, and Divine healing.

**Pedal** (from Lat. *pes*, foot), name given to a lever worked by the foot in various musical instruments, also on a bicycle, etc. The organ has a P. keyboard of 20 or more P.s, producing a musical scale in the bass register, the piano usually only 2 (sustaining, improperly called 'loud,' and 'soft'), whilst the harp has 7 foot levers to raise and lower the pitch of the notes.

**Pedanius**, see DIOSCORIDES, PEDACIUS.  
**Pedestrian Crossings**, see TRAFFIC REGULATIONS AND SIGNS.

**Pedestrianism**, see ATHLETICS.

**Pediculus** and **Pediculosis**, see under LICK.

**Pedigree**, tabular view of the members of any particular family, with the relations in which they stand to each other, together, usually, with some slight notice of the prin. events of the life of each, such as the time and place of birth, marriage, death, and burial. Sometimes these are accompanied by reference to par. registers, monumental inscriptions, marriage settlements, or other documents containing evidence of the facts mentioned in the P. But when much of such additional information is introduced, the record is a genealogical hist. rather than a P. P.s properly so called are not of very frequent occurrence in the writings of the Middle Ages, but later the continual claims to dignities and armorial insignia prompted the College of Heralds to compile a public record of all the families of distinction, and, as a consequence, a splendid collection of P.s (to be found in the visitation books at the College of Arms) has come down to us. Besides these, there are private collections in the library of the Heralds' College and in the Brit. Museum, and in private possession. It is only in the case of peers and those laying claim to arms that the registration of a P. is compulsory. See J. H. Round, *Family Origins*, 1930, and A. W. H. Clarke, *London Pedigrees and Coats of Arms*, 1935.

**Pediment**, triangular space or gable over the portico at the ends of the roof of classic buildings. It is enclosed by horizontal and raking cornices, the latter of which follow the slopes of the roof. It is frequently enriched with sculpture, for which it forms a fine setting. The doors and windows of classic buildings are often surmounted by P.s, either straight-sided or curved.

**Pedlars**, see HAWKERS AND PEDLARS.

**Pedometer**, instrument which indicates the distance walked. Shaped like a watch and carried in the pocket, it is so constructed that when the body is raised by the spring of the foot then a lever acts upon the wheels and an index-hand indicates on a dial plate the number of paces (usually) or the number of miles (more rarely and less accurately) travelled. A *hodometer* (Gk *hodos*, way) is an instrument for indicating the distance

travelled by any wheeled vehicle. Since the mechanism is worked by the revolution of the axle, it is obviously more reliable than a P. A cyclometer is another form used on bicycles. A hubodometer records mileage and checks petrol and oil consumption in a motor vehicle; it occupies the place of the regular hub-cap on one of the front wheels.

**Pedrell, Felipe** (1841-1922), Sp. composer, b. Tortosa, was almost wholly self-taught, but learnt much as a chorister at Tortosa cathedral. He first published music in 1871 and had his first opera, *El último Abencerraje*, produced at Barcelona in 1874. He was the leader of the Sp. nationalist movement in composition and also became a famous scholar in the domain of old Sp. church music, much of which he edited. Among his later operas *Los Pirineos*, 1902, *La Celestina*, 1903, and *El Comte Arnau*, 1921, are the most important; he also wrote incidental music for *King Lear*, church music, cantatas, orchestral and chamber music, etc.

**Pedro I** (Dom Pedro de Alcântara) (1798-1834), emperor of Brazil, b. in Lisbon; the second son of John VI of Portugal and Carlota Joaquina, sister of Ferdinand VII of Spain. He became heir-presumptive to the throne of Portugal by the death of his brother Antonio. In 1807, when Napoleon's troops under Junot invaded Portugal, Dom P. and the rest of the royal family went to Brazil under Brit. protection. In 1817 he married Leopoldina, Archduchess of Austria, daughter of the Emperor Francis I. On his father's return to Portugal in 1821 he became prince-regent of Brazil, and, declaring for Brazilian independence, was crowned emperor in 1822. On the death of John VI of Portugal 10 Mar. 1826, he became Pedro IV of Portugal. In 1828 he was ousted by his brother, Dom Miguel, but abdicating the throne of Brazil in 1831, Dom Pedro returned to Portugal and conducted a successful campaign against his brother. See S. Corrêa da Costa, *Every Inch a King*, 1950.

**Pedro II** (Dom Pedro de Alcântara) (1825-91), Emperor of Brazil, b. in Rio de Janeiro. His father, Pedro I, abdicated in his favour in 1831, and, after a regency, he was crowned in 1841. He ruled with much tact and judgment, but was forced to abdicate in 1889.

**Pedro the Cruel** (1334-69), King of Castile and León, succeeded his father, Alfonso XI in 1350. He was popular with the common people on account of his justice, but alienated the clergy and nobility. When he marched to put down rebellion in Estremadura his brother, Henry, betrayed him and he was taken prisoner; but he escaped and in turn speedily crushed the rebels. Becoming suspicious of everyone, the rest of his reign was occupied in reinforcing his own authority as a feudal tyrant and also in wars against Aragon and Granada. The epithet 'Cruel' was due to the murder of his brother Don Fadrique in 1358. Oppressive taxes now destroyed the popularity he had earned for even-h

justice. His other brother Henry returned from France at the head of other exiles, and supported by Du Guesclin (q.v.) with forces from Aragon and France, and with aid from the Pope. Edward the Black Prince was, however, persuaded to ally himself with P. and defeated Henry and Du Guesclin at Navarrete, 1367. But when P. failed to fulfil his promises Edward recrossed the Pyrenees and left P. to his fate. Rebellions now broke out everywhere against him, and when Henry returned a second time P. was routed at Montiel and slain.

**Peebles:** 1. Co. in S. Scotland, also called Tweeddale, as it consists mainly of the upper valley of the R. Tweed, which rises in the co. P. is bounded by Dumfriesshire on the S., Lanarkshire on the W., Midlothian on the N. and E., and Selkirkshire on the E. and S. There are numerous remains of Brit. hill forts and sepulchral mounds, and there is a Roin. camp at Lyne near Peebles. P. finally came under Scottish rule in 1018. The co., being a group of hills, is mostly pastoral, with the arable lands chiefly in the valleys and on the lower slopes of the uplands. The highest hill is Broad Law (2754 ft); other hills are Hartfell (2650 ft) and Minchmoor (1855 ft). The chief riv. is the Tweed, rising in the S. of the co., which has a number of small tribs. Agriculture and cattle rearing are the chief occupations. Coal is found in the N. of the co. Woollen manufs. are important. The chief tns are Peebles (the co. tn), an anct royal burgh, and Innerleithen. Roxburgh, Selkirk, and P. together return one member to the House of Commons. Area 348 sq. m.; pop. 15,240.

2. Royal burgh (since 1367) and co. tn of the above co., situated at the confluence of the Eddleston with the Tweed, 23 m. S. of Edinburgh. Often visited by the Scottish kings, P. probably received its charter from Alexander III. There are woollen mills. Pop. 6000. 1 m. W. is Neidpath Castle, a massive ruined keep.

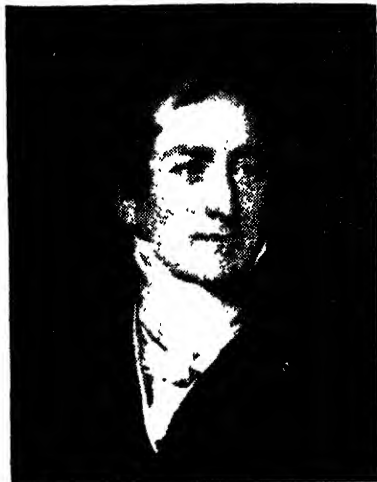
**Peekskill,** tn of New York, U.S.A., in Westchester co., on the Hudson, 42 m. N.E. of New York City. It is in a truck-farm and resort area, and manufs. alcohol, gin, jewellery, and leather and textile goods. Bear Mt Bridge crosses the Hudson 4 m. NW. Pop. 17,730.

**Peel, Arthur Wellesley Peel, Viscount** (1829-1912), politician, youngest son of Sir Robert P., b. London. He was educ. at Eton, and Balliol College, Oxford, and was elected in 1865 Liberal M.P. for Warwick. P. became parl. secretary to the poor law board in 1868, secretary to the board of trade in 1871, and in 1880 under-secretary for the home dept. In 1884 he was chosen to fill the important office with which his name will always be associated, Speaker of the House of Commons, and to which he was 3 times re-elected. On his resignation (owing to falling health) in 1895, he was created a viscount.

**Peel, John** (1776-1854), Cumberland yeoman, who for some fifty years maintained a pack of hounds at Caldbeck,

where he was born and lived all his life. He is known chiefly as the hero of the song *D'ye ken John Peel*, said to have been written impromptu by his friend, John Woodcock Graves, about 1829 (some say 1820), to a folk-tune *Bonnie Annie*. It is the regimental march of the Border Regiment.

**Peel, Sir Robert, second Baronet** (1788-1850), statesman, b. near Bury, Lancs., the eldest son of Sir Robert P., a rich cotton manufacturer. He went to Harrow, and afterwards to Christ Church, Oxford, where in 1807 he took a double



SIR ROBERT PEEL

first. He entered Parliament as a Tory in 1809, and in the following year Lord Liverpool appointed him under-secretary for war and the colonies. This office he held until 1812, when he became chief secretary for Ireland for 6 years, during which period he fought the growing influence of O'Connell, opposed Catholic emancipation, and estab. the Royal Irish Constabulary. He retired from office in 1818 with a considerable reputation as a judicious administrator and an able debater. Four years later he entered Liverpool's Cabinet as home secretary, which office he retained until the Premier's death in 1827. His valuable reforms included the reduction in the number of capital crimes, prison amelioration, and the foundation of the Metropolitan Police (hence nicknamed 'Peelers' or 'Bobbies'). In the following year he was, under Wellington, home secretary and leader of the House of Commons, and in 1829, being convinced of its necessity for the peace of Ireland, supported Wellington's measure for Catholic emancipation. In 1834 he became Prime Minister and



chancellor of the Exchequer, but he held office only for a few months. In opposition he set himself the task of organising the Conservative party, and in 1839, when Melbourne resigned, he was invited to form his second gov., but abandoned the task in consequence of the 'bedchamber question.' He became Prime Minister again in 1841. He held no office save that of the first lord of the Treasury, but he was for all effective purposes chancellor of the Exchequer. As a financier he proved himself extremely capable, and introduced many reforms in the fiscal system of the country; he took steps to develop free trade, taxed incomes over £150 per annum, and carried a Bank Charter Act in 1844. In other spheres, Catholic Irish endowments were permitted, and the Canada-Oregon border dispute settled.

He was at first opposed to the repeal of the corn laws, for which there was strong agitation throughout the country, but after the failure of the harvest in 1845 he became convinced of its necessity. His colleagues would not support him in this, and he resigned; but Lord John Russell failing to form a gov., he returned to office and brought in and carried his Corn Law Bill. He was bitterly attacked for his change of face on this question, but he had earlier laid down the principle which guided him: 'As minister of the crown I reserve to myself, distinctly and unequivocally, the right of adapting my conduct to the exigency of the moment, and to the wants of the country.' A few days after this measure became law he was defeated on an Irish Bill, and retired from office. He was thrown from his horse on Constitution Hill on 29 June 1850, and died from his injuries 3 days later. P. was one of the leading statesmen of his era, distinguished not only for his considerable administrative ability, but also for the intellectual honesty which led him to sacrifice his own interests and those of his party for the sake of measures he considered necessary for the general welfare. His speeches were pub. in 1853, and his memoirs, ed. by Earl Stanhope and E. Cardwell, in 1856. See lives by Justin McCarthy, 1891; C. S. Parker (*Sir Robert Peel, from Private Papers and Correspondence*), 1891-9; J. R. Thurstfield, 1898; and T. Lever, 1942; see also H. W. Davy, *The Age of Grey and Peel*, 1929, and W. P. Morell, *British Colonial Policy in the Age of Peel and Russell*, 1930.

**Peel**, tn and watering place on the W. coast of the Isle of Man, 11 m. NW. of Douglas. On the summit of a rock in Peel Bay are the ruins of an anct castle and cathedral. There are fisheries, and P. is noted for its locally cured kippers. Pop. 2600.

**Peel**, or **Peel-tower** (Lat. *palus*, a stake), a fortified keep, particularly one built in the 16th cent. in the border country of England and Scotland as a defence against raids. It was originally a structure of earth and timber, strengthened with palisades. The later P.s had massive square towers with turrets at the angles, and a door half-way up, the lower vaulted part

being used for cattle, whilst the upper portion served as a dwelling-place.

**Peele, George** (c. 1558-c. 1597), dramatist and poet, b. London. From Christ's Hospital he went to Oxford, where he had a reputation as a poet and wrote his *Tale of Troy*, 1589. It is generally assumed that after coming down from the univ. he became an actor, but of his performances nothing is known. His first play was *The Arraignment of Paris*, 1584, and this was followed by many others, including *The Battle of Alcazar*, printed 1594, *The Old Wives' Tale*, printed 1595, and *David and Bethsabe*, printed 1599, most of which were rewarded with success. He wrote many miscellaneous verses, and the best among them perhaps is the 'gratulatory poem' entitled *The Honour of the Garter*, 1593. His works were ed. by A. Dyce, 1861, and A. H. Bullen, 1888. See study by P. H. Cheffaud, 1913, and H. D. Sykes, *Sidelights in Elizabethan Drama*, 1924.

**Peerage**, see NOBILITY.

**Peerson, Martin** (c. 1572-1650), composer, b. March, was probably under the patronage of Sir Fulke Greville, took the B.Mus. at Oxford in 1613 and about that time moved to London, probably as Master of the Children at St Paul's. He wrote much Eng. and some Lat. church music, fantasies for strings, secular vocal pieces, etc.

**Peeters, Jan**, see PETERS, JAN.

**Peewit**, see PLOVER.

**Pegasus**, winged 'horse of the fountain,' which sprang from the blood of Medusa when her head was struck off by Perseus. While drinking at the fountain of Pirene P. was caught by Bellerophon with a golden bridle, which Athena had given him. On P., Bellerophon conquered the Chimaera, but endeavouring to ascend to heaven upon his winged horse, he fell down upon the earth. P., however, continued his flight to heaven, where he dwelt among the stars. P. was also regarded as the horse of the Muses.

**Pegasus**, anct Gk constellation, called by Tycho Brahe (1628) P. or Equus alatus. These names refer to its resemblance to the form of a horse, P. being the winged horse of Gk legend. It is one of the 21 N. constellations and lies between Andromeda and the head of Aquarius. The 'great square' of P. is formed by  $\alpha$  Pegasi,  $\beta$  Pegasi,  $\gamma$  Pegasi, and  $\alpha$  Andromedae.

**Pegmatite**, very coarse-grained crystalline rock usually occurring in veins. The commonest types of P. are closely related to granites, and consist principally of felspars and quartz. Many P.s contain concentrations of rare elements, and are thus of great economic importance. Gemstones such as beryl and topaz, mica and felspar suitable for industrial purposes, and valuable ores of tin, tungsten and many other metals, can be obtained from some P.s. See PNEUMATOLYSIS.

**Pegu**: 1. Cap. of P. dist., in a div. of the same name, Lower Burma, stands on the riv. of the same name, 45 m. N.E. of Rangoon. The tn was founded in the latter half of the 6th cent. AD, and rose

to a position of great importance in the 16th and 17th cents., being cap. of the Mon P. Empire overthrown by Burma in 1757. There is a fine pagoda still remaining. P. became British in 1852. It is now a railway junction. In the Burmese campaign of 1945 the Jap. Twenty-eighth Army, trying to escape from the Allies' trap near P., was mown down by the allied Fourteenth Army (q.v.). Pop. 25,400. The div. has an area of 13,258 sq. m. and a pop. of 2,961,000. The dist. has an area of 4404 sq. m. with a pop. of 583,000.

2. Riv. of Lower Burma, has a length of 180 m. Its source is in the P. Yoma Mts, and it flows SSE. and SW. to join the Rangoon R.

**Péguy, Charles** (1873-1914). Fr. writer, b. Orleans of peasant stock. His father died when he was a youth, and his mother earned her living by repairing chairs. Overcoming all obstacles, the boy managed to take the courses at the École Normale, and later attended the Sorbonne. He determined to remain in Paris and, with no money, he founded in 1900 a pub. which was destined to become famous, *Les Cahiers de la Quinzaine*. The *Cahiers* were something new in Fr. literary pub. They were not magazines. Rather they were complete books, often written by himself on some burning topic of the day. Romain Rolland contributed some of his best books. Others who were introduced to the Fr. public were the brothers Tharaud, Julien Benda, André Suarez, André Spire, and Bernard Lazare. But P. himself was the ardent soul of the pub. Influenced by Bergson, he proved himself a passionate seeker of the truth. The anti-clerical Socialists and many Catholics were puzzled by P., who was at the same time an ardent Catholic and an ardent Socialist. In the Dreyfus affair he became a zealous Dreyfusard, but he made a distinction between the political Dreyfusards and what he called the Dreyfusard mystics, who battled unselfishly only for the triumph of justice. As a lover of Fr. hist. and an ardent Catholic at heart, he devoted much of his poetry to a celebration of the youth of Joan of Arc. In rapid succession he wrote gigantic poetical works on this subject: *Le Mystère de la charité de Jeanne d'Arc*, 1910; *Le Mystère des saints innocents*, 1912; *La Tapisserie de sainte Geneviève et de Jeanne d'Arc*, 1913. He wrote also an enormous poem entitled *Eve*, 1913. One of his most famous *Cahiers* was devoted to his master Bergson. In both his prose and his verse he hewed out a style for himself in which he did not fear to write in the popular tongue. When the war broke out with Germany he reported at once for active duty, was offered a captaincy, but preferred to be a simple soldier. He was killed 5 Sept. 1914, when fighting in the battle of the Marne. Since his death a whole library has been written about him, notably books by J. and J. Tharaud (1926), Daniel Halévy (*Péguy et les 'Cahiers de la Quinzaine'*, Eng. trans., 1947), and his own son Marcel, who has also

revived the *Cahiers*, and above all by his friend Romain Rolland. Rolland, in his *Charles Péguy*, 1942, has created a brilliant work of art out of the confused material of interminable pamphlets and even more interminable poems left by P. P. is on the whole a political writer, except in such works as *Victor-Marie, Comte Hugo*, 1910, in which he is a great moralist and a great critic, though his style is marred by endless repetition and intolerable exaggeration. See also studies by P. Archambault, 1939; J. Delaporte, 1944; and A. Rousscaux, 1946.

**Pehlavi**, see PAHLAVI.

**Peine**, Ger. tn in the Land of Lower Saxony (q.v.), 23 m. E. by S. of Hanover (q.v.). It has a palace and an old monastery. Oil deposits have been discovered in the vicinity. Pop. 30,000.

**Peine Forte et Dure**, species of torture formerly applied by the law of England to those who, on being arraigned for felony, refused to plead and stood mute, or who peremptorily challenged more than 20 jurors, which was considered a contumacy equivalent to standing mute. In the beginning of the 13th cent. this penalty seems to have consisted merely of a severe imprisonment with low diet, persisted in till the contumacy was overcome. But by the reign of Henry IV it had become the practice to load the offender with weights and thus press him to death; and till nearly the middle of the 18th cent. pressing to death was the lawful mode of punishing persons who stood mute on their arraignment for felony. During the 15th, 16th, 17th, and even the 18th cents. various cases are recorded of the infliction of the punishment in question. Latterly a practice prevailed, which had no sanction from the law, of first trying the effect of tying the thumbs tightly together with whiplcord. Juliana Quick, in 1442, charged with high treason in speaking contemptuously of Henry IV, was pressed to death. Walter Calverly, of Calverly in Yorkshire, arraigned at the York assizes in 1605 for murdering his 2 children and stabbing his wife, was pressed to death in the castle by a large iron weight placed on his breast. In 1720 a person of the name of Phillips was pressed in Newgate for a considerable time till he was released on his submission. As late as 1741 a person is said to have been pressed to death at the Cambridge assizes, the tying of his thumbs having been first tried without effect.

**Peiping**, see PEKING.

**Peipus**, or (Russian) Chudskoye, lake in E. Europe between Estonia and Pskov Oblast of NW. Russia. Length N. to S. 90 m., width 32 m., area 1356 sq. m. It has a S. arm, the Pskov Lake, and is connected through the R. Narova with the Gulf of Finland. The Teutonic Knights were defeated by the Novgorodians in the famous Ice Battle on the P. in 1224.

**Peirce, Charles Santiago Sanders** (1839-1914), Amer. physicist and logician; b. Cambridge, Massachusetts. Graduated, Harvard, 1859. On U.S.A. coast survey. Conducted investigations into earth's

density and ellipticity, and light-wave lengths. First to use term 'pragmatism' in connection with philosophy, to connote a common-sense system in which Belief is identified with Action (see *Popular Science Monthly*, Jan. 1878). When Wm James (q.v.), professing to follow P., substituted Truth for Belief in this formula—thus producing a Pragmatism the opposite of P.'s—P. renamed his own principle Pragmaticism. His chief pub. work was *Studies in Logic*, 1883.

Peirene Fons, see PIRFENE.

Peisistratus, see PISISTRATUS.

Pekan (Indian name), Fisher Marten, or Pennant's Marten (*Martes pennanti*), N. Amer. species, larger than those found in the Old World, being about 4 ft in length, including the tail. Its face is dog-like; fur brown, with white patches on chest and belly. Its favourite food is said to be the Canadian porcupine (*Erythron dorsatus*), but it frequently steals the fish used to bait traps, whence its popular name fisher marten.

Peikin, city, cap. of Tazewell co., Illinois, U.S.A., on Illinois R. and Waterway, in an agric. and coal-mining area, 9 m. S. of Peoria. Chief industries are dairy and food products, distilling, steel tanks, and burial vaults. Pop. 21,900.

Pekinese, breed of lap-dog. It is of Chinese origin, and differs from the Eng. toy spaniel in having a flat skull and tail curved over the loins. Preferably weighing 5-8 lb., it is heavy in front, with short, broad muzzle, falling away lion-like behind. Long-haired, with thick undercoat, it is light-red or yellow, mottled with white. The golden tan are truest to type.

Peking, cap. of China, in the prov. of Hopel, lies in the alluvial plain between the Pailho and the Yungtingho R.s in lat. 39° 54' N. and long. 116° 27' E. From N. to NW. it is partly encircled, at distances of 10 to 20 m., by the Yenshan and Chüntushan mts., which are crowned with the E. section of the Great Wall (q.v.), like the back and wings of an arm-chair; and it faces the P'ohai Bay to the SE. The name P. signifies 'the N. Capital,' to distinguish it from Nanking, 'the S. Capital,' which was once the cap. of the early Ming dynasty (1368-1420). In the 6th cent. BC P. was the site of Chi, cap. of the northernmost State of Yen. In the Han dynasty P. was known as Yüeping, and in the T'ang as Fanyang. It was made the cap. successively by the Khitan (Liao), the Nüchen (Chin), and the Mongolian (Yüan) invaders from the 10th to the 14th cents. In the Yüan dynasty it was called Tatu, 'the Great Capital.' Yung-lo, the 3rd emperor of the Ming dynasty, removed his cap. from Nanking to P. in 1421, and most of its present palaces, temples, and city walls have been built since his time. The Manchus captured the city in 1644, and it remained the cap. of China until 1928, when Chiang Kai-shek moved his gov. to Nanking and renamed P. Peiping, meaning 'the North suppressed.' The removal of the cap. deprived P. of its political significance, which had lasted for 5 cents., and caused the gov. to lose

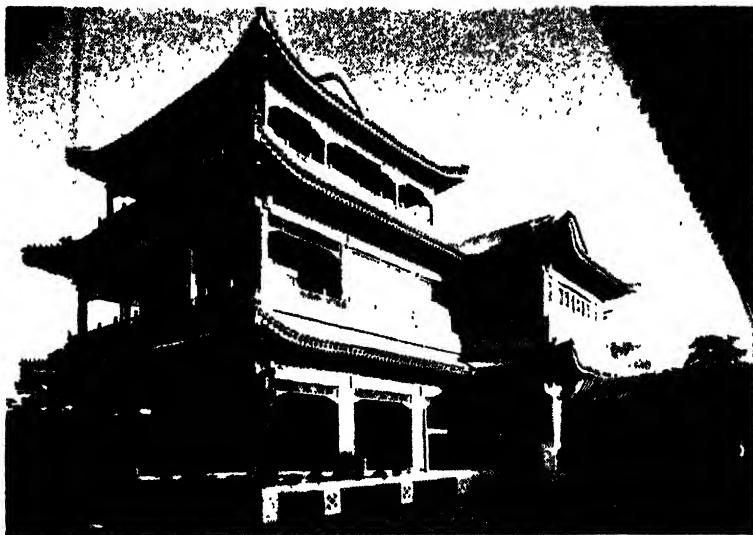
strategic control of Manchuria (q.v.), which was soon afterwards occupied by the Japanese (1931). However, the city remained the cultural centre of China from 1928 onwards, having as its mainstay the 6 best univs. of China and many national research institutes and colleges, which refused to be 'suppressed.' It was in P. that the students launched the May Fourth Movement (see CHINA, History) in 1919; and after the Jap. aggression in 1931 it was again the students of P. who started the nation-wide campaign of United-Front Resistance against the Japanese, and thereby forced the Nanking gov. to alter its subservient policy towards Japan. During the Sino-Jap. War P. was the first victim to fall into Jap. hands, and was occupied by the latter from July 1937 to Sept. 1945. In the ensuing civil war the city was handed over to the People's Liberation Army without a fight on 1 Feb. 1949; and when the Chinese People's Gov. was proclaimed on 1 Oct. 1949, P. was re-estab. as cap. of China.

Since 1950 the metropolitan area has been enlarged to 3 times its old size, and its pop. has grown from a little more than a million before the war to 2,700,000 in 1954 and 4,600,000 in 1957. P. now consists of 3 parts: with the 2 old cities as its centre, it is flanked by 2 newly added areas in the NW. and E. suburbs. The former, stretching 7 m. to the Summer Palace, is the cultural city, occupied by the science institutes of the Academia Sinica, the National Peking Univ. (9000 students), the Tsinghua Univ. (20,000), and more than 20 other univs. and colleges. There are also the huge P. Zoo, the Botanical Garden, the Industrial Exhibition Hall, as well as old parks and temples. The E. suburb is being developed into an industrial city with textile mills and machine factories. The Kuan-tung hydro-electricity station, which supplies P. with water and power, is 40 m. due W. of the old city; between them are the Ment'oukou coal mines and the Shihchingshan steel plant. Due S. is the airfield, which accommodates the largest jet planes, and the main railway junction is 8 m. from the SW. corner of the city. P. is well served with 7 railways stretching in all directions, and both the Yungtingho and the old canal are now navigable. Its air lines link the cap. with all the major cities of the country, including Lhasa, Urumchi, and Kashgar (qq.v.), and with neighbouring countries.

Old P. is composed of 2 cities. The square Inner City (known in Europe as the Tartar City) is surrounded by a massive stone wall 50 ft high and 60 ft thick, each side measuring 4 m. The Outer City, adjoining the S. wall of the Inner City, is oblong in shape, with its longer sides running E.-W. for 5 m. The walls are pierced by 17 gates, which are surmounted by towers 100 ft high. Surrounding the Outer and Inner City walls is a wide moat fed with water from the Jade Fountain Park in the W. Hills. In the W. part of the Inner City is a chain of artificial lakes, the earth therefrom forming hills which are covered with

the rock-gardens, apartments, and temples of the erstwhile Imperial Winter Palace, now open to the public. P. is one of the few caps. in the world that were well planned before they were built. With the square Palace City (perimeter 6½ m.) in the centre of the Inner City, all the broad main streets intersect at right angles with geometrical precision. The Tienanmen (Gate of Heavenly Peace) Square, which is large enough to contain half a million people, and which stretches from the front of the Palace City to the central S. Gate of the Outer City in a straight line

green sea of foliage, with its palaces and towers emerging like islands. Though the suburbs resemble any modern European city, many dists. within the walls of P. remain much as they were cents. ago, with old restaurants, tea-houses, book and stationery shops, medicine-herb shops, and curio and lantern shops dating back to the 17th or 18th cent. The erstwhile picturesque camel caravans, which used to plod the dusty roads, have gone; so have the rickshaws and the demi-monde in the Eight Great Lanes. Buses and tramcars now run on the metalled roads.



*Camera Press*

THE IMPERIAL THEATRE IN THE SUMMER PALACE, PEKING

The front view of the stage. The seats of the audience are placed in the open courtyard.

through parks, is somewhat similar to the Avenue des Champs Élysées in Paris. Outside the N. wall of the Palace City is the Chingshan Hill crowned with 5 pavilions, the central and highest of which occupies a point in the straight line formed by the 3 main palaces in the Palace City, the Tienanmen Tower, the marble Monument of Revolutionary Martyrs (110 ft high), and 4 other anc't towers. To the N. of the Chingshan Hill are the twin Drum and Bell Towers. The whole Palace City is now the site of the Palace Museum and the Historical Museum. The 15th-cent. Temple of Heaven, with its colossal, round, marble Altar of Heaven, is in the SE. corner of the Outer City. The dwelling-houses within the city walls are practically all bungalows built round inner quadrangles, with spacious gardens planted with tall trees, so that in summer the city is a

The P. street is no longer 'a dust tray when the weather is fine, an ink box when it is wet.' The climate of P. is cold and dry in the winter, with the lakes frozen to form ideal skating rinks; but the temp. rises to above 80° F. in summer. There are on the average less than 8 weeks of wet days in the year; but in April there are a few days of very unpleasant dust storms coming from the Gobi desert. Otherwise the P. sky is always blue, against which the glazed porcelain tiles of the palace roofs dazzle the eye with their golden rays.

**Pelagian Islands** (It. *Isole Pelagie*), group of is. in the Mediterranean, lying between Malta and Tunisia (q.v.). They belong to Italy, and administratively are part of the prov. of Agrigento (q.v.). The group consists of Lampedusa (q.v.), Linosa (area 2 sq. m.; pop. 350), and Lampione.

**Pelagic Fauna.** The ocean may be divided into two main parts, benthic and pelagic. The former includes all of the sea bottom, while the latter concerns the whole mass of water. Pelagic animals are those that move freely in the sea between the surface and the sea floor. Some have limited powers of movement and are generally small (plankton), while others (nekton) are larger and more active and are not at the mercy of the currents. The most numerous of the non-microscopic plankton animals are the crustaceans, especially the copepods. Among the nektonic animals are cuttlefish, squid, fishes, and whales.

**Pelagius**, celebrated heresiarch of the early 5th cent., author or systematizer of the doctrine called after him Pelagianism. According to this doctrine there is no original sin, and man does not need grace in order to avoid actual sin and to attain salvation; his free will is sufficient for this purpose, though grace makes the attainment of salvation easier. P. was probably b. about the middle of the 4th cent. in Britain, his name being supposed to be a Gk rendering of the Celtic appellative *Morgan*, or sea-born. He was a monk; it is certain, however, that he never received holy orders. He settled in Rome, and at the end of the 4th cent. he had already acquired a considerable reputation for sanctity and learning. In 410, after the sack of the city by the Goths, he and his disciple Celestius withdrew to Carthage. Here Celestius sought ordination. His doctrines became the subject of discussion, in which St. Augustine took a prominent part, and in a synod sev. opinions ascribed to Celestius were condemned. P. had meanwhile gone to Jerusalem; and news of the proceedings at Carthage having been carried to Palestine in 415, he was accused of heresy before the synod of Jerusalem by Orosius (q.v.). The impeachment failed, and in a synod subsequently held at Diospolis in the same year, P. evaded condemnation by accepting the decrees of the synod of Carthage. The W., however, was more sharp-sighted or less indulgent. A synod of Carthage, in 416, condemned P. and Celestius, and wrote to Pope Innocent I. requesting his approval of the sentence, with which request Innocent complied by a letter which is still extant. On the death of Innocent, Celestius came to Rome in person, and P. addressed a letter to the new Pope Zosimus, and in a council which Zosimus held Celestius gave such explanations that the Pope was led to believe that the doctrines of P. had been misunderstood. A further council of 214 bishops, however, was held at Carthage, in which the doctrines of P. were formally condemned in 9 canons, which were sent to Rome with full explanations. On receipt of these decrees Zosimus reopened the cause, cited and condemned Celestius and P., and pub. a decree, called *Epistola Tractoria*, adopting the canons of the African council. Nineteen ill. bishops refused to accept these canons, and were deposed. Their leader, who may be regarded as the greatest

theological advocate of P., was the celebrated Julian, Bishop of Eclanum, near Beneventum. P. himself was banished from Rome, in 418, by the Emperor Honorius. After his banishment, he is supposed to have returned to his native country, and to have d. there. P.'s *Fourteen Books of a Commentary on St Paul's Epistles*, his *Epistle to Demetrius*, and his *Memorial to Pope Innocent* have escaped destruction, probably from their being included by collectors in the works of St. Jerome. They are much mutilated, but yet almost certainly genuine. See G. Vossius, *History of Pelagius*, 1655, and commentaries by J. F. Duddaeus, 1719, and T. C. Lillenthal, 1738. See also SEMI-PELAGIANISM.

**Pelargonium**, commonly but incorrectly called Geranium, a genus of perennial plants (family Geraniaceae) which, since their introduction from S. Africa at the beginning of the 18th cent., have been highly valued as greenhouse and border plants. As exhibition plants they have not the vogue they formerly had. They are classified into five main groups: (1) zonal, with marked leaves; (2) show, with large flowers, which when semi-double are called regal; (3) fancy, with smaller flowers; (4) ivy-leaved, valuable for hanging baskets; (5) scented-leaved. Cape P.s., yet another group, are mostly evergreen shrubs from the Cape of Good Hope; they need greenhouse culture, as do the show and fancy kinds. All are easily propagated from cuttings. Bedding plants are set out in June and lifted again in Sept. Greenhouse plants can be brought into flower at any time by pinching off flower buds through the summer and properly regulating temp. See GERANIUM.

**Pelagian**, i.e. belonging to the Pelagii, a term used by ant. Gk writers apparently with two distinct meanings. It is used in some places simply as an equivalent of prehistoric or primeval, whilst in other passages a definite race appears to be indicated. If such a race existed it was widely spread over the coasts and is. of the E. Mediterranean and the Aegean; its ethnological relations are obscure. The later Gk writers, such as Hesiod, talk of the Pelagii as a separate race, but their evidence was probably scanty. See *Iliad*, ii. 681-4 and 840-3; x. 428-9; xvi. 233-5, etc.

**Pelayo**, or **Pelagius**, Visigothic chieftain, considered to be the first Christian king of Spain. He became King of Asturias (q.v.) about AD 718. See SPAIN.

**Pelecyopoda**, see RIVALVES.

**Peleus**, son of Acacus and Endeis, brother of Telamon, and King of the Myrmidones at Phthia. Together with Telamon, he was banished for the murder of Phocus, and fled to Eurymion, King of Phthia, in Thessaly, who gave him his daughter Antigone to wife with a third of the kingdom. P. accidentally slew Eurymion at a hunt, and fled to Iolcus. Later he was married to the Nereid Thetis, and became father of Achilles.

**Pelaw Islands**, see PALAU ISLANDS.

**Pelham, Henry** (c. 1695–1754), statesman. He was the younger son of Thomas, first Baron P., and was educ. at Westminster and Hart Hall, Oxford; he entered Parliament in 1717, and 7 years later became secretary for war. He was paymaster of the forces in 1730, and in 1743 first lord of the Treasury and chancellor of the Exchequer. His influence in the House of Commons was based upon systematic corruption.

**Pelham-Holles, Thomas**, elder brother of the above, see NEWCASTLE, DUKE OF.

**Pellias**, son of Poseidon and Tyro (daughter of Salmones) and twin brother of Neleus. Exposed by their mother, the twins were preserved and reared by some countrymen. They later learnt their parentage, and on the death of Cretheus, King of Iolcus, who had married Tyro, they seized his throne, but P. soon expelled Neleus. After P. had long reigned there, Jason came and claimed the kingdom. To get rid of him, P. sent him to Colchis to fetch the golden fleece (see ARGONAUTS). After Jason's return, P. was cut to pieces and boiled by his own daughters (the Pellades), who had been told by Medea (q.v.) that this would restore him to vigour and youth.

**Pelican** (*Pelecanus*), genus of pelicaniform birds, characterised by the 4 toes being united by a web. They have a huge extensible or dilatable pouch which is supported by the 2 flexible bony arches in the lower mandible. The legs are short and the feet large, the tail short and rounded, the neck long, and the body large and ponderous. The wings are long and expansive, and with them the birds are capable of rapid flight, and also of soaring without perceptible movement of the wings. The species are widely distributed, frequenting the seashore, margins of lakes, and feeding almost exclusively on fish, which is deposited in the pouch for subsequent digestion. The common P. (*P. onocrotalus*) formerly existed in Britain, and is now found around the Mediterranean. Its plumage is white, tinged with red. It usually nests on the ground and lays 2 or 3 white eggs. The young are at first brown, and the mother feeds them by pushing their beak into her pouch. The appearance of the red tip of the bill pressed against her breast probably gave origin to the fable that she feeds her young on her own blood. *P. erythrorhynchus* occurs in N. America, where also is found *P. occidentalis*, the only diving P. Species also occur in Australia and Asia.

**Pelican State**, see LOUISIANA.

**Pelileo**, tn of E. central Ecuador, completely destroyed, with others, in the disastrous Ambato earthquake of Aug. 1949. Andean agriculture is carried on. Pop. 2500.

**Pelion**, anc. name of a range of mts on the coast of Thessaly, associated in Gk mythology with Ossa. The giants are said to have piled these two mts one on top of the other to reach Olympus. The chief summit is now called Mt Plessidi (5308 ft).

**Pélissier, Aimable Jean Jacques, Duc de Malakoff** (1794–1864), marshal of France,

b. Maromme, near Rouen. He joined the first expedition to Algiers in 1830. In 1839 he was made lieutenant-colonel and returned to Algeria, taking part in the battle of Isly in 1844. He was made gen. of a div. in 1850, and in the Crimea was at first in command of the first corps and afterwards held the chief command before Sevastopol. The storming of the Malakoff was his most notable success; for this he received a marshal's baton, was created Duc de Malakoff on his return to France, and was granted 100,000 francs. He was Fr. ambas. in London from 1858 to 1859, and from 1860 until his death was governor of Algeria. See life by V. Derrocagail, 1911.

**Peljesac**, peninsula, in Croatia, Yugoslavia. It is 42 m. long and runs parallel to the Dalmatian coast, to which it is joined by a narrow strip of land 25 m. NW. of Dubrovnik. It has rich vineyards, and produces a white wine called *Grko*.

**Pella**: 1. anc. tn of Macedonia, between Salonica and Edessa. The bp of Philip II and Alexander the Great, it was the anc. cap. of Macedonia. A probable site was unearthed in 1957.

2. Dept of Macedonia, Greece. Pop. 117,000.

**Pellagra**, dietary deficiency disease due to lack of the pellagra-preventing vitamin nicotinamide (see VITAMINS). Nicotinamide is one of the B<sub>3</sub> complex of vitamins, is heat stable and readily soluble in cooking juices. It is found mainly in yeast, liver, kidney, heart, pork, beef, and salmon. Nicotinamide is synthesised by the action of the micro-organic flora of the alimentary canal. P. occurs in Italy, Spain, S. France, Algeria, and Egypt. Mild forms are not unknown in this country in people who neglect themselves. The disease is characterised by a sore tongue and mouth, digestive disorders, loss of weight and weakness, irritability, discoloration of the skin, and, in the late stages, mental disorder. The skin rash of P. is similar to sunburn in the early stages, and occurs symmetrically and bilaterally on parts of the body most exposed to light. Later the areas of dermatitis become pigmented and the skin thickened. Pellagra-like symptoms may also occur when there is faulty ingestion, absorption, or utilisation of nicotinamide, as in chronic alcoholism.

**Pellecchia, Monte**, see SABINE HILLS.

**Pellegrini, Carlo** (1839–89), It. caricaturist, b. Capua, but came to England. His work in *Vanity Fair* from 1869, over the signature 'Ape', consisting of a series of portraits of public men, is one of the best examples of personal caricature extant. He also executed a red plaster statuette of Robert Lowe, Lord Sherbrooke.

**Pellegrino**, see VALLE, PIETRO DELLA.

**Pellow, Sir Edward**, see EXMOUTH, VISCOUNT.

**Pellew's Group**, or Sir Edward Pellew's Islands, small group of is. in the SW. of the Gulf of Carpentaria, Australia. They lie close to the coast, opposite Port McArthur.

**Pellicanus, Conrad** (1478-1556), Alsatian scholar and reformer, b. Ruffach, his real name being Kürschner; educ. at Heidelberg. He joined the Franciscans at Ruffach, and was later transferred to Tübingen. He held eccles. positions at Pforzheim and Basel, and became one of the most learned men of his day, especially in Hebrew. In 1526 he turned Protestant, and in 1527 was made by Zwingli prof. of Hebrew at Zurich. He wrote a Heb. grammar (1504; reproduced 1877), an autobiography (Latin, 1877; German, 1891), and a *Biblical Commentary*, 1532-5. See life by E. W. Reuss, 1893.

**Pellico, Silvio** (1789-1854), It. poet, b. Saluzzo, Piedmont. His tragedy entitled *Francesca da Rimini*, 1818, gained him an honourable name amongst It. poets. He also trans. the *Manfred* of Byron, with whom he was acquainted. Having become connected with the secret society of the Carbonari, he suffered 10 years' imprisonment, an account of which he pub. under the title *Le mie Prigioni*, 1833, trans. into most European languages. See lives by R. Barbiera, 1926; and B. Allason, 1933.

**Pellionia**, family Urticaceae, genus of ornamental creeping herbs, with coloured leaves, of which *P. daveauana* with olive-green, tinged violet, elliptic leaves, and *P. pulchra* with oblong, light-green, black-veined leaves, purplish beneath, are both of Cochín-China, and grown in warm greenhouses in Britain.

**Pellisson-Fontanier, Paul** (1624-93), Fr. historian, b. Béziers; studied law at Toulouse and went to Paris. In 1657 he became secretary to Nicolas Fouquet, minister of finance, who in 1659 made him master of accounts at Montpellier. On Fouquet's fall in 1661, P. was imprisoned in the Bastille. He was released in 1666, and became historiographer to Louis XIV, of whom he wrote a hist. (*Histoire de Louis XIV jusqu'à la paix de Nimègue*).

**Pellitory of the Wall** (*Parietaria diffusa*), family Urticaceae, perennial herb, with reddish brittle stems, hairy leaves, and axillary clusters of small flowers. The stamens are very sensitive to touch. It occurs on walls, and an infusion was a rustic medicine. Tincture of P. is made from *Anacardium pyrethrum* of S. Europe.

Pell-mell, see MALL, THE.

**Pelopidas**, Theban statesman and gen. In 383, when Thebes was taken by the Spartans, he went to Athens to form a party for the liberation of the city. In 379 he forced the Spartan garrison of Thebes to surrender. In 375 he defeated the Spartans at Tegyra, and in 371, in conjunction with Epaminondas, estab. Theban supremacy by the victory of Leuctra. In 367 he went on an embassy to Persia, and in 364 was killed in a successful battle against Alexander of Phœræ at Cynoscephalæ.

**Peloponnese** (*Pelops* and *nēsos*, island, i.e. the is. of Pelops (q.v.)), also called *Morea*, the peninsula forming the S. part of Greece (q.v.), connected with central Greece by the isthmus of Corinth and separated by the Gulfs of Lepanto and

Patras. It was divided into the dists. of Achaia, Sicyonia, Corinthia, Argolis, Arcadia, Laconia, Messenia, and Elis; the chief rivs. were the Eurotas and the Alpheus. The chief cities were Sparta and Argos, the latter holding supremacy until the 7th cent. bc and the former thenceforward to the 3rd cent. The name *Morea* is due to the peninsula's resemblance to a mulberry leaf. Patras is the chief port. Area 8354 sq. m. Pop. 1,129,000.

**Peloponnesian War**, chiefly between Athens and Sparta, lasted with some intervals from 431 to 404 bc. The war may be divided into 3 main periods: (1) from the beginning until the peace of Nicias in 421 bc; (2) from the peace of Nicias until 413, when the peace was formally broken by Sparta; (3) from 413 to the capture of Athens in 404 bc. During the first period Athens was successful until 424 bc, when the fortune of war changed. The Athenian leader for the first two and a half years was Pericles, and thenceforward Nicias. The Spartan gen. Brasidas saved Megara and transferred the war into Thrace. Athens was greatly afraid of the spread of disaffection among her subject cities, and made peace on slightly disadvantageous but not dishonourable terms. During the second period, although nominally at peace, Athens and Sparta were continually employed in plots against each other's interests, and fought in the Peloponnese and in Sicily. During the third period Alcibiades, who was in joint command of the Athenian expedition to Sicily, was recalled, and went for a time to Sparta. The Athenians were finally expelled from Sicily with heavy loss, and the war transferred to Asia Minor. Prior to 408 Athens won sev. naval victories, although many of her subject allies revolted. After the battle of Cyzicus in 410 the Spartans made proposals of peace which were rejected by Athens. The fortunes of the war now gradually went against Athens until, after the destruction of her fleet at Aegospotami in 405 bc and a 5-months' siege, the city surrendered in April 404. The defences were destroyed and Athens was made subject to Sparta, being handed over to an oligarchy of 30. See also GREECE, History. See the *History of the Peloponnesian War*, by Thucydides, a contemporary; B. W. Henderson, *The Great War between Athens and Sparta*, 1927; G. B. Grundy, *Thucydides and the History of his Age*, 1948.

**Pelops**, grandson of Zeus, and son of Tantalus, King of Phrygia, and Dione or Euryanassa. To test the divinity of certain gods who visited him, Tantalus served them a repast in which the main dish consisted of P. None touched the dish save Demeter, who tasted the shoulder. Zeus restored P. to life and replaced the missing shoulder by one of ivory. P. married Hippodamia, daughter of Oenomaus of Elis, by defeating the latter in a chariot race, after bribing Myrtilus, the king's charioteer; Myrtilus tampered with the chariot, which broke down, killing

Oenomaus, but when he claimed the bribe, P. threw him into the sea. As he died he cursed the house of P., and his curses were fulfilled. P. was honoured among the Greeks, especially at the Olympic games, which he restored. The Peloponnesus (island of P.) was named after him. See Ovid, *Metamorphoses*, vi. 404; Virgil, *Georgics*, iii. 7; Pindar, *Olympionicae*, i. 24; Hyginus, *Fabularum Liber*, 84; Sophocles, *Electra*, 505; Pausanias, v. 1; Apollodorus, ii. 4, 5, etc.

**Pelota** (Lat. *pila*; Sp. *pella*, ball), ball game popular in Spain, the Fr. Basque dist., and Sp. America. Players wear a curved basket attachment (*cesta*) on the right hand. The hard ball weighs about 4 oz., is made of rubber and wire, and is covered with leather. It is struck with the *cesta* against 2 walls at right angles.

**Pelotas**, second city in Rio Grande do Sul, Brazil, at the S. of Lagoa dos Patos; 20 m. NW. of Rio Grande by rail. The chief industry is the preserving of beef, while hides are also exported. There are glass factories and flour mills. Pop. 80,000.

**Peltasts**, light infantry of anct Greece; so called from the *peltē*, a small round shield.

**Peltonen, Vihtori** (real name Johannes Linnankoski) (1869-1913), Finnish author, one of the men who, with Kivi, founded modern Finnish literature, was b. at Askola. His father was a vagabond labourer, who often, tiring of working on a farm, went from market to market with horses, or laboured with the bands who pilot the timber floating down the rivers and lakes. The boy thus knew no settled home and had no chance of schooling; but he heard from his illiterate parents many of the current folk-tales, and managed to learn his letters and to read books. In 1881 he entered a school for teachers at Jyväskylä, not so much with the idea of making teaching a profession as to become educ. His fame chiefly rests on *The Song of the Red Flower*, 1905, a novel which details the amours of a young man who works in guiding down the river the gigantic output of logs. Other novels and plays followed in rapid succession and he became the animating spirit of the Finnish League. Among other things he led a vast public movement to substitute genuine Finnish for Swedish family names. He then made a tour of Europe, including England, France, Italy, and Germany, to see all he could of old civilisations. He issued another fine novel, *The Fugitives*, 1908, sev. dramas, and a number of short stories. See lives by W. Söderhjelm, 1918, and A. Anttila 1921.

**Pelts**, see **Furs**.

**Pelusium**, old city and port of Egypt, 20 m. E. of Port Said. From the Persian period it was an important fortress on the E. frontier of Egypt.

**Pelvis**, bony basin which supports the abdominal viscera and distributes the weight of the trunk to the two legs. It is formed by the sacrum, the coccyx, and the ossa innominata, or haunch bones; each of the haunch bones consists of 3 originally separate bones, grown together

in the adult; the ilium, ischium, and pubis. At the junction of these a socket is formed which takes the ball-end of the femur, or thigh-bone. The contained vessels for both sexes are the rectum and urinary bladder; for the male, the vesiculæ seminales and the prostate gland; for the female, uterus and ovaries. The female P. is, in consequence, broader but shallower, while having a greater capacity; the bones are more slender, the inlet more circular; it is in general modified suitably for the necessity of child-bearing.

**Pelycosaurs**, or **Theromorphs**, primitive synapsidan mammal-like reptiles found in the late Carboniferous and lower Permian of Texas and elsewhere. Some forms (e.g. *Dimetrodon*) had long spines down the back, probably connected by membranes to form a 'sail'; this was probably a heat-regulating device.

**Pemba**, is. off the E. coast of Africa, 30 m. NNE. of Zanzibar, to which protectorate it belongs. A fertile and beautiful is., Arabs call it Al-huthera, or the Green Is., its green hills abruptly rising from the sea. The climate is not suitable for continued residence by Europeans. The ruins of P. belong probably to the later Middle Ages, when the prosperity of the Arab and Persian settlements of the E. African coast was at its peak. A vigorous trade went on in slaves, ivory, and rhinoceros horn, for which latter there is still an insatiable demand in the Far East for its allegedly aphrodisiacal properties. The whole of the SW. is devoted to clove-growing. Besides the trade in cloves there is a trade in copra. Some 11 m. W. of the tn of Chaka is Messali, sometimes called 'Captain Kidd's Is.' owing to the tradition that Kidd buried his treasure there. Burton states that Kidd was here, but others aver that there is no evidence to that effect. The people still retain a kind of bull-fighting. Witchcraft and the cult of devil-worship still prevail in P., and sorcery and black magic have a hold on the bulk of the people. P. was sighted by Vasco da Gama on his epoch-making voyage from Lisbon to India in 1497. It shared the fortunes of the E. coast in its earlier hist.; in 1627 it was involved in the general rising against the Portuguese following a massacre of Christians at Mombasa. Area 380 sq. m. Pop. 100,000 approx., of whom 30,000 are Arabs. See J. F. E. Craster, *Pemba: the Spice Island*, 1913.

**Pemberton, Henry** (1694-1771), physican, chemist, and geometer, b. London, pupil and friend of Boerhaave at Leyden. He became prof. of physic at Gresham College, London. P. contributed papers to *Philosophical Transactions* (see vols. xxxii-lxii), one of these winning him Newton's friendship. He superintended the third ed. of Newton's *Principia*, 1726. P.'s works include *View of Newton's Philosophy*, 1728; *Lectures on Physiology*, 1733; and *Lectures on Chemistry and Physiology* (ed. by J. Wilson, 1771, 1779).

**Pemberton, Sir Max** (1863-1950), novelist, b. Birmingham. He was educ. at Merchant Taylors' and Cambridge. In



1885 he joined the staff of *Vanity Fair*, from 1892 to 1893 edited *Chums*, and from 1896 to 1906 *Cassell's Magazine*. The *Diary of a Scoundrel*, 1891, was his first novel, but his most famous books were *The Iron Pirate*, 1893, with its sequel *Captain Black*, 1911. Others of his books are *The Sea Wolves*, 1894, *The Impregnable City*, 1895, *Kronstadt*, 1898, *Pro Patria*, 1901, *My Sword for Lafayette*, 1906, and *The Great White Army*, 1915. In 1920 he founded the London School of Journalism, and in 1922 pub. a memoir of Lord Northcliffe, with whom he had been associated for many years. He was knighted in 1928, and in 1936 wrote *Sixty Years Ago and After*, his own reminiscences.

**Pemberton** SW. suburb of Wigan (q.v.), Lancs, England, forming 4 wards of the co. bor. It is engaged in cotton spinning and coal mining.

**Pembrey**, coastal vil. of Carmarthen, S. Wales, 5 m. from Llanelli. Pop. 1700.

**Pembroke, Earl of**, see AYMER.

**Pembroke, Mary**, Countess of (1557-1621), Eng. poetess, b. Ticknell, near Bewdley, was the sister of Sir Philip Sidney, and became the countess of Pembroke on her marriage with Henry Herbert, Earl of Pembroke in 1577. It was at her suggestion that Sir Philip Sidney wrote his *Arcadia*, and she was a patroness of Daniel, Ben Jonson, and other poets. She herself was the authoress of sev. poetical works and the translator of *A Discourse of Life and Death*, 1592, from the Fr. of P. Mornay. See life by F. B. Young, 1912.

**Pembroke, William Herbert**, third Earl of (1580-1630), courtier and patron of letters, b. Wilton, eldest son of Henry Herbert, second earl of Pembroke, whom he succeeded in 1601, educ. at Oxford. He was disgraced for an intrigue with Mary Fitton (q.v.). A patron of Ben Jonson, Massinger, Wm Browne, Inigo Jones, and others, he was also interested in the Virginia, NW. Passage, Bermuda, and E. India companies. P. was lord chamberlain of the royal household, 1615-25; lord steward, 1626-30; and chancellor of Oxford Univ. from 1617, Pembroke College being named after him. To him and to his brother Philip, the first folio of Shakespeare's works was dedicated.

**Pembroke:** 1. Seaport in the co. of Pembroke, Wales, on an inlet of Milford Haven. Its castle, in a good state of preservation, is an interesting building dating from Norman times. P. was formerly a gov. dockyard tn. It is now an R.A.F. flying-boat station and military garrison tn. Pop. 12,890.

2. Dist. of Dublin, Rep. of Ireland, on the SE. of the city. Pop. 34,500.

3. Cap. of Renfrew co., Ontario, Canada, on Lake Alouette in the Ottawa R. Pop. 13,910.

**Pembroke College**, Cambridge, founded in 1347 by Marie de St Pol, widow of Aymer de Valence, earl of Pembroke. Its chapel (the first college chapel in Cambridge) was converted into a library after the building of Wren's chapel (his

first work) in 1663. The college remained small until the later half of the 19th cent., but has always been famous for its bishops (Rotherham, Ridley, Andrewes) and its poets (Spenser, Crashaw, Gray, Smart).

**Pembroke College**, Oxford, founded in 1624 on the site of an anc. seminary known as Broadgates Hall, by King James I, at the expense of Thomas Tosdale and Richard Wightwick, named after the earl of Pembroke, then chancellor of the univ. Samuel Johnson was at P. See D. Maclean, *A History of Pembroke College, anciently Broadgates Hall*, 1897.

**Pembrokeshire**, maritime co. of S. Wales, westernmost co. of the principality, bounded on the S. by the Bristol Channel, and on the W. and N. by St George's Channel, adjoining the cos. of Cardigan and Carmarthen. The chief bays are Milford Haven and St Bride's (the coast of which is now largely National Trust property), and the smaller bays are Fishguard and Newport, all with good anchorages. A number of is. lie off the P. coast, including Skokholm, Skomer, Caldy, Ramsey, and Grassholm (qq.v.), and many rocky islets, among them the group known as the Bishops and Clerks, with a lighthouse. The shores on the S. are wild and precipitous, fronted by high cliffs. Inland the surface is undulating, with green hills alternating with fertile valleys. The prin. elevations are the Prescelly Hills (q.v.) in the NE. of the co.; the most important rivs. are the E. and W. Cleddau, which unite and form a navigable portion of Milford Haven. There are many prehistoric monuments. Coal is worked; agriculture, fishing, and woollen milling are the prin. industries. Haverfordwest (q.v.) is the co. tn; Milford Haven (q.v.) is scheduled for development as a major oil port. The co. returns 1 member to Parliament. Area 614 sq. m.; pop. 80,900.

**Pemmican**, originally made by N. Amer. Indians and used as a food. It consisted of dried buffalo meat or venison, from which all fat was removed. This was made into a paste and afterwards formed into cakes. Present-day P. is manufactured and tinned in England by Messrs Bovril Ltd, who make it of fibrin of beef and fat. It is used extensively on expeditions both to the Arctic and Antarctic, and to mts in all parts of the world (especially the Himalaya) on account of its high protein and caloric values.

**Pemphigus**, class of skin diseases characterised by blisters or bullae (q.v.). An acute form, *P. neonatorum*, sometimes occurs in newborn infants, and is due, usually, to a streptococcal infection of the skin. This type of P., although far less common than formerly, is highly infectious and can cause epidemiological problems in infant nurseries.

**Pen** (from Lat. *penna*, (quill-) feather). The modern pen had its origin in the reed or calamus, which is still used for the purpose in the E. The anc. Egyptians, like the Chinese and Jap. of the present day, used a brush for writing, while the

Romans and Greeks used the sharp point of the stilus to scratch their characters on waxen tablets. It is impossible to say when the quill-feather superseded the reed; there is no doubt that for quite a long period both the reed and the quill-feather were in use. St Isidore of Seville (c. 600) mentions both as being used in his time. At any rate, because of its suitability for writing on vellum (the main literary writing material of the Middle Ages), the quill-feather was the main pen of the Middle Ages, and, indeed, even of modern times down to the 19th cent. Turkey quills were most often used, but swan quills were much valued, and crow quills for fine lines. Owing to the loss of time involved in mending the points of quill nibs, various attempts were made to give durability to them by gilding (Watt in 1818), and by attaching to them horn or tortoiseshell tips (Hawkins and Mordan). The only satisfactory substitute, however, was found to be the complete steel nib, which was first introduced in London in 1803 by Wise, and came into general use about 1830, when Perry, Mason, and Gillott, of Birmingham, began to make them by machinery. Sometimes the steel is alloyed with silver, platinum, or rhodium, but this greatly increases the expense, while a gold nib with a ruby at the tip has been found to be of great durability and almost perfect for writing. The fountain pen with a reservoir in its stem and a gold iridium-pointed nib is now in general use, while the stylographic pen with a wire point instead of a nib is a development of an earlier pen used for writing music; ball-pointed P.s (though the basic idea was patented in the U.S.A. in 1888) are a recent development. The steel is prepared at Sheffield, but Birmingham is the centre of the pen trade in England. See W. Higgins, *Pen Practice*, 1948.

**P.E.N. Club, The**, founded in 1921 by C. A. Dawson Scott, Eng. novelist. The first president was John Galsworthy, who was succeeded in 1936 by H. G. Wells. It is a world association of writers, editors, and translators, with centres in most caps., and its aim is 'to promote and maintain friendship and intellectual co-operation between men of letters in all countries in the interests of literature, freedom of expression, and international good will.' International congresses are held annually; the first in London in 1923, subsequently in U.S.A., France, Germany, Belgium, Norway, Austria, Poland, Holland, Hungary, Yugoslavia, Scotland, Catalonia, Argentina, France, Czechoslovakia, England (in 1941 during the Second World War), Sweden, Switzerland, Italy, Denmark, England (1956), and Japan (1957). It has devoted much attention to problems of refugee writers and was appointed by the Home Office to advise on enemy alien writers during the Second World War. International presidents after Wells have been Jules Romains, Maurice Maeterlinck, Benedetto Croce, Charles Morgan, and André Chamson; Eng. presidents have been J. B. Priestley, Henry W. Nevins, and

Storm Jameson, Desmond MacCarthy, and C. V. Wedgwood. H.Q. in London; secretary of Eng. centre and of the International, David Carver.

**Pen-name**, see PSEUDONYM.

**Penal Servitude**, see PRISONS.

**Penal Statute**, one which imposes a pecuniary penalty or some other form of punishment for the breach of its provisions. It is a rule of law that a P. S. must be strictly construed, and must not be extended to any case which is not clearly within both the spirit and letter of the enactment. Action under P. S. must, where no time is expressly limited, be brought within 6 months of the cause of complaint. The term is in particular applied to anti-Catholic measures in England and Ireland during the 17th and 18th cents.

**Penance** (Lat. *paenitentia*). In ecclesiastical parlance this word is used for 4 distinct things: (1) a virtue, of which the chief acts or manifestations are contrition or sorrow for sin, and satisfaction or self-inflicted punishment in atonement for sin; (2) a censure, i.e. a punishment imposed by ecclesiastical law, and involving deprivation of spiritual goods; (3) the sacrament of confession (q.v.); (4) the satisfaction imposed by the priest in this sacrament.

**Penang, Pulo Penang, or Prince of Wales Island**, state of the Federation of Malaya (q.v.). Until 1946 it formed part of the Straits Settlements (q.v.); from 1946 to 1957, though part of the Malayan Union, and, subsequently, of the Federation of Malaya, as estab. in 1948. P. remained a Brit. settlement. In 1957 when Malaya achieved dominion status, the Brit. Crown's sovereignty over P. was withdrawn. P. is an is., situated off the W. coast of the Malay Peninsula, at the N. end of the straits of Malacca, about 360 m. N. of Singapore. It is 15 m. long by 8 m. broad, flat and fertile for over half its area, rising at 'the peak' to 2922 ft. The port and cap. is Georgetown, or P. on the E. coast. The prin. products, besides tin, which is dug at the base of the mt., are sugar, coffee, rice, pepper, cloves, nutmegs, coco-nuts, and areca nuts. Area 108 sq. m.; pop. 642,300. As an administrative area P. includes P. Is., the strip of mainland opposite known as Prov. Wellesley (q.v.), and, prior to 1935, the Dindings ter. It is the emporium for much of the trade of Sumatra and the Malay Peninsula. The is. was ceded to the E. India Co. by the rajah of Kedah in 1785. By the pirate-suppression treaty of Pangkor (confirming the cession of Pangkor Is. and the Sembilan Is. to Britain), the strip of ter. of the mainland opposite P., known as the Dindings, also became British and remained a part of the settlement of P. until its retrocession to the state of Perak in 1935. P. was made a separate presidency, of equal rank with Madras and Bombay, in 1805. In 1826 Singapore and Malacca were incorporated with it under Brit. gov., P. still remaining the seat of gov. (In 1936 the seat of gov. of the Straits Settlements was transferred to Singapore.) With the estab. of P. the

trade of Malacca passed to it. But when Singapore was founded P. in its turn had to yield first place to the port with the superior strategic position, and came to depend chiefly on the local trade. Once inconsiderable, that trade has become important with the development of tin-mining and rubber planting in the adjacent states, and the development of trade with neighbouring countries.

**Penarth**, resort of Glamorgan, Wales, 4 m. S. of Cardiff, with a fine esplanade and pier, and a coastal steamer service to the Bristol Channel. Pop. 18,870.

**Penates**, anct. Rom. gods of the household, who presided over the family life, and were worshipped at the family hearth. There were P. of public life also, who ruled the welfare of the State. *See also* LARES.

**Penoil**: 1. Name given to the small brushes used by artists, whether made of hog's bristles, camel's hair, fitch, or sable. The larger brushes are sometimes set in a tin tube, and the smaller are generally set in quills of different sizes. The well-known black-lead P. is made of black-lead, graphite, or plumbago. The finest plumbago is obtained from a mine in Cumberland. Some P.s are filled with coloured chalk instead of black-lead. The ever-pointed P. is an instrument for using cylindrical pieces of black-lead, which are forced forward in the P. just so far as to allow them to be used without breaking.

2. In optics, the name given to the rays of light which converge to or from a given point.

3. In geometry, a set of straight lines passing through a point; each line is called a ray of the P.

4. *See* FLAG, 2 *ad init.*

**Penda** (c. 577-654), King of Mercia (c. 632-54). With Cadwallon, he defeated and killed Edwin of Northumbria at Hatfield (632). P. also conquered and killed Oswald (q.v.) of Northumbria at Maserfield (641). This victory made P. the most powerful king in England. Finally, Oswy, King of Northumbria, killed P. in battle at Winwaed (654) (unidentified). Though P. himself was staunchly pagan, and the enemy of many Christian rulers, he does not seem to have objected when his son Peada was baptised (653) and introduced priests into the ter. he was ruling under his father. *See* Bede's *Ecclesiastical History*; *Anglo-Saxon Chronicle*; and F. M. Stenton, *Anglo-Saxon England*, 1943.

**Pendant**, long narrow flag, *see* FLAG; **PENNANT**.

**Pendant**: 1. In late Gothic or Tudor architecture, an ornament of stone, plaster, or wood, suspended from a fan-vault (as at Henry VIII's Chapel, Westminster) or a plaster ceiling or a timber roof-truss.

2. In Jacobean architecture, an ornament at the foot of the newel-post (q.v.) of a staircase.

**Pender**, Sir John (1815-96), manufacturer and director of cable companies, b. in the Vale of Leven. P. was engaged in the manuf. of textiles before he turned his attention to cables. He eventually

took an important part in financing and managing the many companies which arose when the success of the Atlantic cable had shown the world its practical utility. He promoted cable enterprises in all parts of the world, and subsequently controlled companies whose combined capital was over £15,000,000 and who owned 74,000 nautical m. of cables. He represented Wick Burghs in Parliament for sev. years.

**Pendine**, vil. of Carmarthenshire, Wales, situated on Carmarthen Bay. There is a fine stretch of sand, which has been used for motor-car speed tests. Pop. 250.

**Pendleton**, *see* SALFORD.

**Pendulum**. A simple P. is defined as a heavy particle suspended from a fixed point by a fine, inextensible, massless, rigid thread so that it is free to oscillate in a vertical plane. Although this is an ideal P., its motion is of great importance in the investigation of problems concerning real or compound P.s. When Galileo, according to tradition, timed the oscillations of a swinging lamp at Pisa by means of his pulse, he was observing an approximation to a simple P., and he discovered that the oscillations were isochronous—i.e. the time for one complete oscillation was always the same. Mathematical calculation leads to the formula  $t = 2\pi\sqrt{l/g}$  for a complete oscillation of a simple P., where  $t$  is the time,  $l$  the length of the P., and  $g$  the acceleration due to gravity at the place where the P. is situated. Notice that the period is independent of the mass of the bob. This formula is true only for a small arc of swing. If  $\phi$  is the half-angle of swing in radians, a good approximation to the time of an oscillation  $t = 2\pi\sqrt{l/g(1 + \phi^2/16)}$ . From this law knowing  $g$  at any place, we can construct a P. to beat any required time, or can determine what time a given P. will beat, or by arranging length and observing time we can find the value of  $g$ . This last is of great importance:  $g = \pi^2$  when the P. beats secs., i.e. time for one half oscillation is 1 sec.; or  $g = 9.8696$  times the length of the secs. P. this value of  $g$  must be increased by  $\cos^2\theta/g/289$  ( $\theta = \text{lat.}$ ) owing to centrifugal force of rotation of the earth. Thus at London,  $g = 32.121$  ft per sec.<sup>2</sup> (Sabine); New York, 32.160 (Sabine); Edinburgh, 32.204 (Kater); Rawak, 32.088 (Frey-clinet); Spitzbergen 32.253 (Sabine). From this and other results it is found that gravity increases towards the poles and is least at the equator, largely explained by the spheroidal shape of the earth and its rotation. If  $w = \text{loss of weight between equator and pole}$ ,  $c = \text{centrifugal force at equator}$ , both expressed as fractions of  $g$  at the equator,  $d = \text{ellipticity of the planet}$ , then  $d + w = 2\frac{1}{3} \times c$  (Clairaut, 1742), whence  $d = \frac{1}{296}$  approx.

The density of the earth was found by means of a P. by Maskelyne in 1774; again in 1832 at Arthur's Seat, Edinburgh, by determining the attraction from the vertical due to the mass of a mt; again by comparing oscillations at surface and

bottom of a mine by Airy in 1856. Foucault, in 1851, by means of a P., rendered the rotation of the earth visible. The P. appeared to alter its swing direction regularly; the law is: the total angle described by the plane of the P. in a day =  $360^\circ \sin \theta$ , where  $\theta$  is the lat. If a simple P. swings, in a horizontal circle, instead of a vertical plane, describing a cone of semi-angle  $\beta$ , its period =  $2\pi\sqrt{l \cos \beta / g} = 2\pi\sqrt{h/g}$ , where  $l$  is the length of the generating line of the cone and  $h$  its height. No P. is mathematically simple, and the determination of its length is not easy.

**Kater's pendulum**; one form consists of a brass tube 4 ft long, 3 in. diameter, one end weighted. Parallel knife edges are inserted at right angles at equal distances from the ends and the whole apparatus is so adjusted that the times of swing will be equal and not far from 1 sec. when swung either end up. The length between the knife edges gives the length of the equivalent simple P. All P.s used in practice are compound; defined as a rigid body oscillating about a fixed horizontal axis. The time

of oscillation is given by the formula  $t = 2\pi\sqrt{\frac{k^2 + h^2}{gh}}$ , where  $k$  is the radius of gyration of the P. about an axis through its centre of gravity parallel to the axis of oscillation, and  $h$  is the distance between the centre of gravity of the P. and the point of suspension. Thus the length of the equivalent simple P. is  $\frac{k^2 + h^2}{h}$ .

Fig. 1 is a body (i.e. a compound P.) suspended at O, G its centre of gravity; K

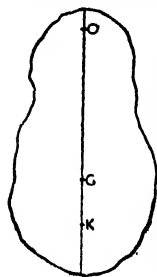


FIG. 1

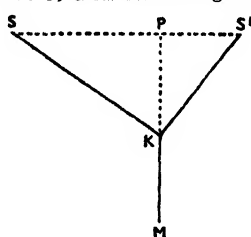


FIG. 2

a point in the line passing through OG such that if K be made the point of suspension the time of oscillation is not changed. K is called the centre of oscillation and also the centre of percussion (q.v.). The length OK equals the length of the equivalent simple P.

**Blackburn's pendulum** (Fig. 2) is a contrivance arranged for tracing, by means of ink trickling from a bob, various harmonic curves. The mass M is suspended

at S and S' from a string knotted to two others at K. The mass moves on a curved surface, the prin. curvature at the lowest points being 1/P.M and 1/K.M; its motion is therefore compounded of the two simple harmonic motions  $2\pi\sqrt{PM/g}$  and  $2\pi\sqrt{KM/g}$  for small oscillations.

**Ballistic pendulum** is a P. formerly used for measuring velocities, such as that of a bullet, and therefore for testing gunpowder. A mass of wood forms the 'bob,' and swings backwards when the bullet is fired into it, so that no jar is given to the pivot or point of suspension. The momentum in the bullet before entering the wood now belongs to the whole mass, of which it becomes a part. The amplitude of the displacement of the P. is a measure of the momentum of the bullet before entering the wood. The velocity is obtained from a formula involving a number of factors. The device was invented by Robins (1740) and has been improved. The gun itself may be suspended as a P. and the arc of recoil measured; small arms are thus tested by the 'gunéprouvette.' See also HOROLOGY.

See any standard book on dynamics. For elementary work: S. L. Loney, *Elements of Dynamics*, 1953. For more advanced work: A. S. Ramsey, *Dynamics*, Pt 1 1933, Pt 2 1944; J. H. Poynting and J. J. Thomson, *Properties of Matter*, 1947; and C. J. L. Wagstaff, *Properties of Matter*, 1953.

**Penelope**, wife of Odysseus and mother of Telemachus, who was a baby when Odysseus left for the Trojan war. In his long absence, P. was wooed by persistent suitors, but put them off with the excuse that she had to weave a robe for Laertes, her father-in-law, while she undid by night her work of the day. Odysseus returned in time to save her and kill these parasites. She is the type of wifely faithfulness.

**Penetangore**, see KINCARDINE.

**Penge**, urb. dist. and par. of Kent, England, 7 m. S.E. of London, on the S. Region of Brit. Railways. The larger part of the Crystal Palace (q.v.) grounds is within the urban dist. Pop. 25,370.

**P'enghu Islands**, see PESCADORES.

**Penguin**, common name of the members of a family Spheniscidae, order Sphenisciformes, found only in the S. hemisphere, and characterised by the modification of the wings into paddles or flippers. The wing is long and has no covert or quill feathers, and always remains open. The feathers are tiny, with very broad shafts and but little vane or web. The legs of the birds are placed far back, and in the water the feet are stretched out straight behind and held motionless, the wings working rapidly as if being used in flight. The position of the legs causes the gait of the birds on land to be very awkward, but on snow slopes they are able to toboggan at a rapid pace, propelling themselves with the powerful legs assisted by the wings. They stand upright, and this characteristic, with their columnar bearing and many curious traits, often gives them a remarkably human appearance. They

are essentially aquatic birds, and their coming on shore is chiefly for the breeding season, when they assemble in rookeries, whose number is estimated as 750,000 at Cape Adare. The nest is often no more than a slight hollow in the ground, but some P.s, especially the Adélie P., put themselves to a great deal of trouble to collect stones, with which they bank the nest round, an occupation which frequently develops thieving habits. Two eggs are laid, and both birds, but chiefly the male, attend to their incubation. Both parents are very devoted to the young, one always staying to guard them, the other bringing them, often at great



A. F. Lewis

## PENGUIN PROTECTING YOUNG

labour, from the sea crustaceans and other small animals, which the young take by pushing their beaks far down their parent's throat. When they are old enough to move away from the nest, the relationships often become hopelessly confused. The moult of P.s is remarkable in that the short, scale-like feathers are flaked off like the sloughing of a reptile's skin rather than the shedding of plumage. The emperor and king penguins possess a pouch, in the form of a feathered fold of skin near to the feet on the central surface, used to shelter the eggs and young. With the exception of a single tropical species which inhabits the Galapagos Is., and a few others, P.s are almost confined to the colder regions. Large rookeries have been found at very low latitudes. The largest species is the emperor P., which breeds far S. during the winter darkness. It is nearly 4 ft long, and the plumage is dark slate on the back and white on the underparts, with yellow spots on the head. The king P. occurs on Kerguelen Is., the Falkland Is., and others of about the same lat., 50° S. With it is generally found the Gentoo P., the feet of which, as well as the lower mandible and lower

part of the upper mandible, are bright yellow. The eggs are palatable, and are taken in great numbers by sealers and whalers. See also ANTARCTIC. See R. C. Murphy, *Oceanic Birds of South America*, 1936.

**Penguin Books.** This enterprise was founded in 1935 by Allen Lane (nephew of the famous Victorian publisher, John Lane of the Bodley Head) and his 2 brothers, John and Richard. Its original aim was to provide low-priced reprints of good fiction in large popular eds. The venture met with rapid success, and within 2 years more than 100 titles had been issued as Penguins at a price of 6d. a vol. In 1937 a complementary series, Pelican Books, was begun in order to develop 'the diffusion of knowledge' through cultural and scientific books. This series includes a substantial and increasing proportion of vols. specially written as Pelicans. Many other separate series now appear under various Penguin imprints, among them the illustrated King Penguins, the Penguin Classics (in new translations), the Puffin Books for children, the Penguin Modern Painters (with colour plates), the Penguin Shakespeare, the Penguin Music Scores, etc. More than half the output of P. B. Ltd. consists of vols. written expressly for one or other of the series and not pub. in any other form. In its first 21 years of existence the total titles issued amounted to 2500, and the total output in this period was 200,000,000 copies.

**Pengwern,** see SHREWSBURY.

**Peniakoff, Vladimir,** see POPSKI'S PRIVATE ARMY.

**Penicillin.** The name is derived from the green mould or fungus *Penicillium* (Lat. a brush, referring to the appearance of the spore-bearing branches under the microscope); various species of *Penicillium* are common on decaying and damaged fruit such as oranges and on cheese. In 1928 a culture of *Staphylococcus* bacteria growing in the laboratory of Sir Alexander Fleming (q.v.) was observed by him to be contaminated with a colony of *Penicillium*, later identified as *P. notatum*. Fleming noted that the growth of the bacteria was retarded close to the mould, and subsequent experiments showed that the inhibitory action was exerted on other bacteria, such as the haemolytic *Streptococcus* and the organisms of pneumonia, gonorrhoea, and diphtheria. On the other hand, there was no effect, for instance, on the bacteria of tuberculosis, influenza, and *Bacillus coli*. During the Second World War the effective material P. was obtained in a relatively pure and stable form by the Oxford workers under Sir Howard Florey and Dr E. Chain, and was produced in the U.S.A. and in England for the treatment of service personnel and later of civilians. In 1948 the chemical composition of various forms of P. was pub., and attempts at synthesis have been made. Fleming's original strain of *P. notatum* remained the commercial source until 1945, when another strain was used. P. is particularly useful as an antibacterial agent, since it is non-poisonous even in large doses, in.

contrast to such drugs as salvarsan and the sulphonamides. Other fungi have since been investigated to ascertain whether they contain similar substances; streptomycin, useful in tuberculosis, has been extracted by Waksman (1944) from *Streptomyces griseus*, and chloromycetin, also from a species of *Streptomyces*. Chloromycetin, synthesised in 1949, is proving of value in the treatment of scrub typhus and typhoid and other diseases, as is also aureomycin. Search for further antibiotics is continually in progress. It has been more extensive in the U.S.A. than anywhere else, with the

corpuscles are diminished in number. See also under ANTIBIOTICS.

**Penicillium**, a genus of fungi, class Ascomycetes, known as Green or Blue Moulds; about 100 species, cosmopolitan in origin. See **PENICILLIN**.

**Peninsula**, piece of land jutting out into, and almost surrounded by, the sea. It differs from a cape in that it is connected to the mainland by an isthmus.

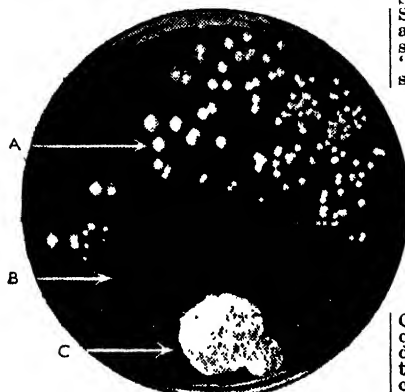
**Peninsula State**, see **FLORIDA**.

**Peninsular and Oriental Steam Navigation Company**, commonly called The P. & O., was incorporated under that title in 1840. Since 1837 the Peninsular Steam Navigation Company running to Spain and Portugal had been in operation, and with the inauguration of a regular mail service by the company to India, the 'Oriental' was then added. Their first ship was the *William Fawcett* of 296 tons, chartered for the purpose, as was the *Royal Tar*, built in 1832. Prior to the opening of the Suez Canal, passengers and cargo had to be transported across the isthmus to the steamer awaiting them at Suez, and the route, originally opened up by Thomas Waghorn, developed under P. & O. control to an extensive business with special Nile steamers, coaches between Cairo and Suez, with rest houses, and many thousands of camels for the cargo. The Australian mail service was started in 1857, and other routes extended to

China, Japan, and the Black Sea. The opening of the canal in 1869 naturally disrupted the whole elaborate organisation and caused difficulties over the mail contract; but the company continued to prosper, its vessels increasing gradually in size and speed. In the early 1900s they were exceeding 10,000 tons in size. In 1914 came fusion with the Brit. India Steam Navigation Company, who possessed one of the world's largest fleets, and later control of well-known lines like the New Zealand Shipping Company, the Union Steamship Company of New Zealand, the General Steam Navigation Company, the Hain Line, and the Strick Line.

To-day many P. & O. ships exceed 20,000 tons, like the well-known *Strath* class, the *Himalaya* of 28,000 tons, put into service in 1949, the *Arcadia* 29,734 tons and *Iberia* 29,614 tons, both delivered in 1954. Heavy war losses from 1939 to 1945 caused great delay in the resumption of normal services, but to-day, by means of a greater sea speed, the company is endeavouring to make up for its lack of ships by faster voyages. Cargo liners of 7000-9000 tons, each taking 12 passengers, are being run at 17 knots, whilst passenger ships are running at from 19 to 22 knots. On 1 Jan. 1956 the P. & O. had 30 ships in service totalling 411,750 tons. The tonnage of the P. & O. group of associated lines totalled over 2,000,000, with 141,315 tons still under construction. See *Boyd Cable, A Hundred Year History of the P. & O., 1837-1937*, 1937.

**Peninsular War (1808-14)**. The continental system (q.v.) of Napoleon had been



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**PENICILLIN: THE ORIGINAL PLATE**

The staphylococci planted on the plate had developed into the fully formed colonies seen at A. The mould C developed from a spore which fell on the plate after the colonies had grown up. The mould produced penicillin which destroyed the staphylococcus colonies in the area B; the nearest ones completely, and those farther out remain only as shadowy remnants.

result that the more recent discoveries are Amer. monopolies. The search is stimulated by the desire to find antibiotics which will be specific against those bacteria which are not susceptible to the present range of antibiotics, and by the fact that in course of time bacteria develop strains which are resistant to the antibiotics. Thus staphylococci, normally killed by penicillin, may become resistant to it. The bacteria of tuberculosis may become resistant to streptomycin, and so on. The most recent antibiotics to be discovered are terramycin, polymyxin, and erythromycin. Some antibiotics may be toxic to certain people. Streptomycin can attack the inner ear and cause deafness, and chloromycetin may cause a blood disease called agranulocytosis, in which the white blood

accepted by all the nations of Europe with the exception of Portugal, and Napoleon's schemes of oriental conquest required a maritime base. Therefore in Oct. 1807 the emperor concluded the secret treaty of Fontainebleau for the conquest and partition of that country with the King of Spain, no doubt planning the acquisition of the latter state also. In the following month the Fr. army under Junot seized Lisbon, and the Portuguese royal family sailed to Brazil. Before Mar. of the following year, Napoleon had dispatched nearly 100,000 more men into Spain, ostensibly to reinforce Junot; riots then broke out in Madrid against Charles IV, who abdicated in favour of his son Ferdinand VII. The latter, however, left Madrid for France, where he was held a prisoner, and Charles again occupied the throne, until on 5 May he surrendered the crown by the treaty of Bayonne to Napoleon, who bestowed it on his brother Joseph. This led to an insurrection in favour of Ferdinand VII., and in June 1808 Portugal appealed to England for aid. An expedition under Sir Arthur Wellesley sailed for Corunna on 12 July, and Joseph quitted Madrid and retired to the R. Ebro. The Eng. troops, assisted by the insurgents, defeated Laborde at Rolica and Junot at Vimiero, and the latter was compelled to sign the convention of Cintra at Torres Vedras on 30 Aug., by which he evacuated Portugal and retired to France.

Napoleon had meanwhile consolidated an alliance with the tsar, and decided to lead the grand army into Spain in person. This he did, and entered Madrid on 4 Dec. 1808; Spain was, however, by no means subdued, and extensive guerrilla fighting took place. Sir John Moore (q.v.) conducted a well-planned diversionary movement, ending in a retreat to his ships at Corunna. Napoleon returned to France, and in the battle of Corunna on 16 Jan. 1809, the Eng. army was victorious, although it embarked afterwards, according to plan, and Sir John Moore was killed. There were now 3 theatres of war: in the E., in Portugal, and in Andalusia. In the first Lannes and Mortier besieged Saragossa, which surrendered 21 Feb., and St Cyr invested Gerona. In Portugal Soult occupied Oporto, but had to retire into Galicia; the English under Wellington won the battle of Talavera, but Del Parque was defeated by Soult, with Victor, Sebastiani, and Mortier, at Alba de Tormes. During the winter of 1809-10, Wellington built the lines of Torres Vedras, forming an invincible position between the Tagus and the sea. In 1810 Masséna moved against Wellington, but was checked at Busaco, and Wellington retired behind the lines of Torres Vedras. Meantime Ney had captured Ciudad Rodrigo and Almeida. In Andalusia the French took Granada, Málaga, and Seville, and besieged Cadiz. In 1811 Masséna, isolated by 'scorched-earth' tactics and the impregnability of the Torres Vedras position, retreated from his winter quarters at Santarém to Salamanca, pursued by Wellington, who

defeated him at Barrosa, and later (3 and 5 May), at the battle of Fuentes de Oñoro. Soult came to the assistance of Masséna and, though defeated at the battle of Albuera (16 May), obliged the allies to raise the siege of Badajoz. In 1812 Wellington had been reinforced, and captured Ciudad Rodrigo on 19 Jan., Badajoz on 6 April, and Almaraz Bridge on 17 May. After defeating Marmont at Salamanca (see ARAPILES, LOS), he entered Madrid and then besieged Burgos; Soult, however, raised the siege, and forced Wellington to retreat into Portugal. Meantime, in the E. of the country Suchet had captured all the towns save Alicante and Cartagena between 1810 and 1812, and had defeated Blake at Sagunto in 1811. In 1813 Wellington began to take the offensive, as the withdrawal of troops which was necessitated by the Fr. disaster in Russia left Joseph with only about 72,000 men against 100,000. Joseph was beaten at Vitoria on 21 June, and fled into France. Soult immediately returned from France to take command, but could not prevent Wellington from capturing San Sebastian (31 Sept.), crossing the Bidassoa into France (7 Oct.), and taking Pamplona (25 Oct.). From this time the hist. of the war is the gradual weakening and continued defeats of Soult; in Nov. the Novelle was crossed, in Dec. there was fierce fighting in front of Bayonne, and on 10 April the battle of Toulouse ended in Wellington's capture of the city, whilst on 18 April Soult signed a convention for the suspension of hostilities. Soult displayed great skill and admirable firmness and tenacity in this last campaign, and was beaten because opposed by a greater gen. who had better troops.

The reasons for Wellington's success, which are also the reasons for the Fr. failure, may be briefly summarised as follows: Wellington's line tactics proved the answer to the Fr. system of attack in heavy columns; his supply system was superior; the Fr. operations covered too large an area and were not sufficiently controlled by a central authority on the spot; Napoleon's system of conducting the war in Spain from Paris was fundamentally unsound; the guerrillas greatly hampered the French. On the other hand, Wellington had to contend against lack of money, Sp. intrigues, and lack of equipment, particularly of engineers for siege work. The P. W. proved a continuous drain upon Fr. resources, as Napoleon himself admitted. Moreover, it gave a new hope to the defeated countries of Europe, in that Wellington proved the Fr. system of warfare to be by no means the invincible weapon it had for so long seemed to be. The best hist. of the war is C. W. Oman, *A History of the Peninsular War, 1802-30*. See also W. Napier, *History of the Peninsular War, 1828-40*; Lt.-Col Garwood (ed.) *Wellington's Dispatches, 1841*; W. Tomkinson, *Diary of a Cavalry Officer, 1894*; A. I. Shand, *The War in the Peninsula, 1898*; J. B. Jourdan, *Mémoires du Maréchal Jourdan (guerre d'Espagne), 1899*; F. Beaton, *With Wellington in the Pyrenees, 1914*;

and B. D'Urban, *Peninsula Journal*, 1930.

**Penis**, intromittent organ, or phallus, of the male animal, whereby the sperms, which later fertilise the eggs, are transferred to the vagina of the female during the mating process (coitus or copulation). A P. is present in some invertebrates, such as the common whelk, and particularly in parasites, as for instance the tape-worm, where it facilitates fertilisation inside the body of the host. Fertilisation is usually external in fishes and amphibians, so that a P. is absent, but in some fishes, such as the viviparous tropical species, and also the common dogfish, a copulatory organ occurs, though it is not usually known as a P. Amongst reptiles a paired P. is found in the snakes and lizards; in birds, such as the domestic fowl, the sperm is transferred by the juxtaposition of the cloacal apertures during coitus, and there is no P. In man, an example of the mammals, the P. is a cylindrical organ which terminates in the glans, the latter covered by the prepuce or foreskin: internally the P. contains 3 spongy masses: the 2 corpora cavernosa dorsally and the single corpus spongiosum ventrally. The corpora become engorged with blood and cause the erection of the P. in copulation; the corpus spongiosum is traversed by the urethra, the passage for the urine.

**Penistone**, mkt tn in the W. Riding of Yorks, England, on the R. Don, 13 m. NW. of Sheffield. Agriculture and the manuf. of steel goods are the chief industries. P. is the head of the P. parl. div., and also head of a co. council div. Pop. 6560.

**Penitential Psalms**, 7 psalms of a penitential character chosen from the O.T., i.e. Psalm vi, xxxii, xxxviii, li, cii, cxxx, cxliii, of which Psalm cii, *Miserere*, is the most striking. Their selection dates back to the 3rd cent. at least. They are frequently used as an act of private devotion.

**Penitentiary** (*Sacra Penitentiaria*), one of the tribunals of the papal court. The name *Penitentiarius* is also given to the cardinal who presides over this tribunal and to officials associated with it. The office of the P. is concerned with all questions relating to the confessional and private discipline. It deals with applications for the remission of eccles. censures, and for dispensations from the ordinary marriage laws of the Church, and with specially reserved cases of conscience. Meetings for the settlement of these cases are held monthly, and, if necessary, they are then referred directly to the Pope. See also PRISONS.

**Penkridge**, tn of Staffordshire, England, 6 m. S. of Stafford. It is generally accepted as the Rom. Pennocrucium. Pop. 2780.

**Penley**, William Sydney (1852-1912), actor, b. Margate; began life as a choir-boy, and then became clerk in a drapery business. In 1871 he went on the stage, and soon after achieved success as the foreman in Gilbert and Sullivan's *Trial by Jury*. His position steadily improved until he played the curate in *The*

*Private Secretary*, when he took his place as the leading London low-comedy actor. In 1892 he produced *Charley's Aunt*, and drew crowds to see the play and his delightfully humorous performance. The play brought him a fortune.

**Penmaenmawr**, seaside resort and urban dist. of Wales, in Caernarvonshire, on Conway Bay, 4 m. WSW. of Conway. To the W. of the tn rises the height of P. (1550 ft), on whose crest was, until 1920, a hill fort and Druidical remains. About 1 m. from the coast, at the foot of the Sychnant Pass, is the vil. of Dwygyfylchi, known locally as the 'Old Village'. Pop. of urban dist. 4218.

**Penn**, Sir William (1621-70), adm., b. probably at Bristol; served under Blake in the Dutch war, and was in command of the Blue squadron at the battle off Portland (1653). In the following year he was appointed gen. and commander-in-chief of the fleet designed to proceed against the Spaniards in the W. Indies. Together with Gen. Venables, he tried to atone for his failure to take Hispaniola by the capture of Jamaica from the Spaniards (May 1655), the inhab. falling an easy prey to his ragamuffin army of 8000 troops in 38 ships. Appointed naval commander-in-chief at Jamaica, he returned to England without leave and was imprisoned for a short term. He entered into negotiation with the Royalists, and at the Restoration was knighted, and made a commissioner of the navy. He had a command at the battle of Lowestoft (1665), but was not again employed on active service. There is a memoir by Granville P. and a portrait in the hist. gallery of the Institute of Jamaica (Kingston). See *Penny's Diary*.

**Penn**, William (1614-1718), Quaker, founder of Pennsylvania, b. London, a son of Adm. Sir Wm P. He was educ. at Christ Church, Oxford, but was sent down from the univ. for non-conformity. He became a Quaker about 1667, and in the following year was imprisoned for publishing his *Sandy Foundation Shaken*. Released from the Tower in 1669 by his father's influence, he was perpetually persecuted for expressing his religious views. His father's death brought him a fortune and a claim against the Crown which he commuted for a grant of land in N. America, where he founded, in 1681, the colony of Pennsylvania for his persecuted co-religionists. He was in England from 1684 for 15 years and took an active part in religious controversy. His friendship with James II brought some advantages to the Quakers. The closing years of his life were clouded by financial difficulties and mental illness. His works were collected in 1726, and ed. with a jour. of his life, by J. Besse. See biography, 1872, by W. H. Dixon, who refutes the charges of scandalous conduct detailed by Macaulay; and lives by S. M. Janney, 1852; J. Stoughton, 1882; A. C. Thomas, 1895; Mrs C. Grant, 1908; J. W. Graham, 1916; and W. I. Hull, 1937; also H. M. Jenkins, *The Family of William Penn*, 1899, and L. V. Hodgkin, *Gulielma, Wife of William Penn*, 1947.



**Penn.** vil. and par. of Buckinghamshire, England, 2½ m. from High Wycombe. The church (13th cent.) has a 15th-cent. painted Doom. Penn is reputedly the home of the ancestors of Wm Penn, founder of Pennsylvania. Pop. 2350.

**Penn.** Lower, par. of Staffordshire, England, 3 m. SW. of Wolverhampton. Pop. 1650.

**Pennalism**, see FLAGGING.



WILLIAM PENN

**Pennant, Thomas** (1726-98), zoologist and traveller, b. Downing, Flintshire. He was educ. at Wrexham School and subsequently at Oxford. In 1766 he commenced the pub. of his first great work, the *British Zoology*. In 1765, during the progress of this work, P. made a tour on the Continent. P. in 1771 pub. a *Synopsis of Quadrupeds*. He followed the arrangement conceived by Ray, introducing the genera estab. by Linnaeus. The *Synopsis*, when enlarged, was repub. under the title of *A History of Quadrupeds*, 1781. After his return to England, P. commenced a work on *Indian Zoology* (2nd ed., 1790), of which 15 folio plates were publ. The next work which P. commenced was a systematic catalogue called the *Genera of Birds*, but it was never completed. His last great work was his *Arctic Zoology* (2 vols., 1784-7). He also wrote a number of works of travel, including *Tours in Scotland* (1771-5), and *Wales* (1778-81). See his *Literary Life*, 1793.

**Pennant** (a compromise between 'pendant' and 'pennon'), general name for most pointed flags which are long in the fly as compared with the hoist. A signal P. is 9 ft long, and tapers from 2 ft at the mast to 1 ft at the end. The nautical P. is a swallow-tailed flag, about twice as

long as it is broad, flown at the mast-head of a ship in commission. A broad P. is flown to show the ship of a commodore. The paying-off P. is a very long streamer with a bladder at the end, and is flown by a ship on its return to port. Special flags flown at church times, meal times, etc., are also called P.s. P.s were attached to a knight bachelor's lance; later they were used in Brit. lancer regiments, and on section-leaders' vehicles in armoured-car regiments. Brit. mail-carrying air-liners also carry P.s.

**Pennatula**, **Sea Pen**, or **Sea Rod**, genus of coral polyps of the order Alcyonaria. A fairly common Brit. species is *P. phosphorea*, so called from its phosphorescent character, though this is possessed by other species.

**Pennell, Joseph** (1857-1926), Amer. artist and author, b. Philadelphia. In 1884 he married Elizabeth Robins, with whom he collaborated in producing numerous books of travel and description, amongst which are *Our Sentimental Journey through France and Italy*, *A Canterbury Pilgrimage*, and *Our Journey to the Hebrides*. They were close friends of the artist Whistler, whose biography P. pub. in 1908. His *Life and Letters* were pub. by his wife in 1929.

**Pennine Alps**, important div. of the Central Alps, which extend from the Great St Bernard Pass eastward to the Simplon Pass, the Rhône forming their N. boundary. The name Pennine is not often applied to the W. portion, from the Little St Bernard Pass to Col Ferret, which is called the Chain of Mont Blanc. In the P. A. are the Comain dist., the Arolla dist., the Zermatt dist., and the Saas dist. Amongst the highest peaks found in the range are Mt Vélan (12,353 ft), Grand Combin (14,168 ft), Mont Blanc de Seillon (12,695 ft), Tête Blanche (12,300 ft), Dent d'Hérens (13,710 ft), Grand Cornier (13,020 ft), Matterhorn (14,690 ft), and Monte Rosa, of which the highest peak is the Dufourspitze (15,215 ft).

**Pennine Chain**, mt group of England, beginning to the S. of the Lower Tyne valley and extending to the middle of Derbyshire and the N. of Staffordshire. It is sometimes called the 'backbone of England', but is more in the nature of a series of uplands than a chain of mts. The chief summits are Cross Fell (2930 ft), Wharfedale (2414 ft), Ingleboro (2373 ft), Pen-y-ghent (2273 ft), and Kinder Scout (The Peak) (2088 ft).

**Pennisetum**, genus of ann. and perennial grasses, some of which bear very decorative inflorescences with long awns or bristles, and an abundance of ornamental foliage. Perennial *P. latifolium* and annuals *P. villosum* and *ruppelii* are grown in gardens. *P. typhoides*, spiked millet, is an Indian cereal, and *P. ciliata* a valuable tropical fodder grass.

**Pennon**, see FLAG; PENNANT.

**Pennsylvania**, known as the **Keystone State**, one of the 13 original states of the U.S.A.; sends to Congress 2 senators and 30 representatives, and is the third largest in pop., which was estimated at 10,498,012

in 1950. It is about 160 m. wide and 382 m. long. Gross area 45,333 sq. m., of which 288 sq. m. is water surface (excluding Lake Erie). Harrisburg is the cap., and P. is bounded on the N. by New York and Lake Erie, on the E. by New York and New Jersey, on the S. by Delaware, Maryland, and W. Virginia, and on the W. by W. Virginia and Ohio. This state is one of the richest mineral regions in the world, and ranks second in the U.S.A. with a production worth \$1,186,212,000 in 1950. There are immense bituminous coalfields and also large fields of anthracite coal, which together form 80 per cent of the value of mineral products; the great oilfields lie in the W. of the state. Petroleum was first discovered in 1859; boring for it is one of the great industries of P., ann. production reaching 11,150,000 barrels in 1951. The state produces 30 per cent of U.S.A.'s steel, and large quantities of coke, pig-iron, and ferro-alloys, Pittsburgh being the centre of the smelting industry. Besides iron and steel products, there are electrical goods and equipment. The state as a whole comes next to New York in its industries, the ann. output reaching a value of \$10,506,454,000 in 1950. Other leading products are textiles, petroleum products, food, machinery, fabricated metal products, glass, chemicals, transportation equipment, paper, tobacco products, packed meats, electrical and household appliances, and aluminium products. The climate is healthy but subject to extremes of cold and heat. There are 15,000,000 ac. of forest land, and lumbering is a source of wealth in the N. In the S. and SW. are forests of hemlock and virgin beech. The great Cumberland valley is a fine farming dist. The farms are small but well tilled; hay is the chief crop, but wheat and other cereals are grown. Poultry farming is a source of wealth, and horses are raised in this state, and cattle, especially a fine though small breed of cows, similar to the Jersey cows in appearance. C. 15,000,000 ac. are in farm and range land, of which 6,600,000 ac. are in crops, the farmers being mainly those descendants of Ger. settlers famous as 'P. Dutch.' The Appalachian range crosses P.; a part of the Allegheny range, with Mt Davis (3,213 ft) as the highest summit, lies in the SW.; and between them and the Blue Ridge or Kittatinny Mts are fertile valleys. Slate, limestone, and marble quarries abound, especially in the dist. round Philadelphia. The R. Delaware drains the whole of the E. part of the state, and runs into Delaware Bay, the sea entering the riv. for 30 m., thus forming an immense estuary. Other rivs. are the Susquehanna, with tribs., West Branch and Juniata, and in the W. the Allegheny R. and the Monongahela unite, forming the Ohio.

The univs. and colleges include the univs. of P. (founded 1740) and of Pittsburgh (1787), P. State College (1855), Swarthmore College (Quaker) (1864), Carnegie Institute of Technology (1900), Temple Univ. of Philadelphia (1884),

Drexel Institute (1891), Lafayette College (1826), Bryn Mawr College for Women (1880), and Lehigh Univ. (1865).

Charles II gave to Wm Penn (q.v.) in 1681 large grants of land in this state, but the first settlers were Swedes, and once it was called New Sweden. The state took an active part in the revolution and the war of 1812, and also in the Civil war of N. and S., when its nearness to the field of action made its situation most dangerous. Had the battle of Gettysburg been a S. victory, the state would have been invaded by the S. army. Two famous strikes, in 1892 and 1902, had great economic influence on state affairs, and the panic of 1907 had an unfortunate effect in business quarters, and much money was lost and many banks failed.

The P. Railroad (q.v.) Company controls a considerable part of the railways of the state. Other railways are the Lehigh Valley, the Pennsylvania-Reading, and the Reading. In 1945 there were 9934 m. of steam railway and 2294 m. of electric. In 1947 there were 158 airports. There are 3 fine ports: Erie, on Lake Erie, with large domestic trade; Pittsburgh, conducting the Ohio R. trade; and Philadelphia. The prin. cities and their populations are: Philadelphia, 2,071,605; Pittsburgh, 678,806; Erie, 130,803; Scranton, 125,536; Reading, 109,320; Allentown, 106,756; Harrisburg, 89,540; Upper Darby, 84,951; Altoona, 77,177; Wilkes-Barre, 76,826; Bethlehem, 66,340; Chester, 66,039; Lancaster, 63,774; Johnstown, 63,232; York, 60,000; McKeesport, 51,500. See S. W. Pennypacker, *Pennsylvania in American History*, 1910; A. E. Martin and H. H. Shenk, *Pennsylvania History: Told by Contemporaries*, 1925; G. P. Donohoo, *Pennsylvania, a History*, 4 vols., 1936; A. Pound, *The Penns of Pennsylvania and England*, 1932; S. J. and E. H. Buck, *The Planting of Civilisation in Western Pennsylvania*, 1939; Federal Writers' Project (pub.), *Pennsylvania: A Guide to the Keystone State*, 1940; and O. S. Heckmann (ed.), *What to Read about Pennsylvania*, 1942.

Pennsylvania, University of, situated in Philadelphia, is said to have been founded by Benjamin Franklin in 1740, though it would be truer to say that he initiated the movements which led to its foundation. Housed in magnificent buildings with an endowment of \$17,500,000, it has over 9500 students and more than 800 profs. It comprises the College of the Univ. of P., School of Fine Arts, College of Liberal Arts for Women, the Engineering Schools (Chemical, Civil, Electrical, Mechanical, Metallurgical), Wharton School of Finance and Commerce, School of Education, Graduate School of Arts and Sciences, medical, legal, and dental schools. Its library of more than 700,000 vols. contains also a priceless collection of the papers of Benjamin Franklin.

Pennsylvania Railroad, one of the greatest Amer. railway systems, comprises within its general organisation a main line and 50 subsidiaries with a

total mileage of 10,239, of which 665 m. have been electrified. It was originally incorporated in 1846 for the purpose of building a line from Harrisburg to Pittsburgh within the state of Pennsylvania. This was completed in 1854 and then extended to Philadelphia in 1857. To-day it covers a vast ter. roughly bounded by the Atlantic Ocean and the Mississippi R., its main lines running N. of the Mason and Dixon line, although it also penetrates S. of it. The bulk of the pop. and of the industries of the nation are enclosed in the ter. it serves. Most of the big cities within that ter. are reached by one or more of its lines. The Pennsylvania was one of the first to introduce all-steel cars. Trains enter its terminals (from New Jersey) in New York by a tunnel under the Hudson R.

Penny, most anct. of Eng. coins. First mentioned in the laws of Ine, King of the W. Saxons, it weighed then about  $\frac{1}{240}$  of the Saxon pound weight. The Romans similarly divided the *libra* into 20 *solidi*, and the *solidus* into 12 *denarii*, i.e. 1 *denarius*  $\frac{1}{240}$  of a *libra* or pound.

No halfpennies were coined before the late 9th cent., and no farthings before the time of Edward I, the P. having its reverse divided up by a cross so that it could be broken into four parts. Under Edward VI silver farthings ceased, and silver halfpennies under the Commonwealth. In 1662 'milled' edges were introduced to guard against clipping. In 1672 halfpennies and farthings were struck in copper and P.s. weighing 1 oz. avoirdupois in the same metal in 1797. These copper P.s. had the value of  $\frac{1}{32}$  oz. of silver, but the bronze P., introduced in 1860, had only about half this value. The Ger. *Pfennig* was also originally silver, and bore the same relation to the Ger. pound of silver as the Eng. P. to its pound. In the modern Ger. system the *Pfennig* is a small copper coin. P. is colloquially used for 'cent' in the E. U.S.A. See METROLOGY.

Penny Banks. These were first estab. about 1850, and have since become very numerous, rising from 200 in 1860 to sev. thousand. In 1878 they received legislative sanction to the investment of their funds, and in 1904 came under the control of the Savings Bank Act. Their object is to furnish easy means for the thrifty, and especially children in schools, to accumulate savings from slender resources. Many of these banks are now in touch with the Post Office Savings Bank (see SAVINGS BANKS, *Post Office Savings Bank*), and P. B. form a branch of the activities of practically all the missions. The Yorkshire Penny Bank is not controlled by the Savings Bank Act.

Pennyroyal (*Mentha pulegium*), fragrant prostrate mint which grows in damp places on Brit. moors. It bears ovate, nearly smooth leaves and axillary whorls of reddish-purple flowers.

Pennyweight, see METROLOGY.

Pennywort, common name given to sev.

plants. *Umbilicus rupestris*, family Crusulaceae, is Wall P., or Navelwort, native perennial of rocks and walls; *Linaria cymbalaria*, family Scrophulariaceae, climbing perennial, is also Penny-leaf, Mother-of-Thousands, Kenilworth Ivy; and *Hydrocotyle vulgaris*, family Hydrocotylaceae, a floating aquatic perennial, also known as White-rot; all found in Britain and Europe.

Penobscot: 1. Riv. of Maine, U.S.A., rising in Somerset co., and flowing E. into Chesuncook Lake, and then S. into P. Bay, an inlet of the Atlantic Ocean. It is about 350 m. long and is identified with the mythical riv. Norumbega (q.v.). It is navigable to Bangor.

2. Tribe of N. Amer. Indians of Algonquin stock. They sided with the French in the colonial war, but made a treaty with the English in 1749, on whose side they fought during the war of independence. About 500 now live on a reservation in Maine.

Penology. P. is the study of legal punishment as distinct from the study of the criminal, though the two subjects cannot be wholly separated, since punishments must have some relevance to the persons punished and no penal system can be effective that ignores the character of the criminal and the problems of the causation of crime. The impulse to punish wrongdoing is so deeply-rooted that many people accept the imposition on the law-breaker of penalties which involve varying degrees of unpleasantness without thought as to the purpose of State punishment.

Punishment has at different periods fulfilled varying purposes. In some primitive communities it has been imposed to satisfy the anger of an outraged god and so protect the community from his vengeance. At a later stage it took the place of private vengeance. By limiting the right of the individual to secure redress by his own initiative it stopped the continual blood feud and was in fact a means of lessening rather than increasing the punishment imposed on the evil-doer.

In modern states the 3 principles which have been advanced to sanction their penal systems have been the retributive, the deterrent, and the reformative. Retributive punishment has been justified on 2 grounds. Firstly, that it is necessary as an expression of the community's detestation of crime. But any legal sanction, even if it is wholly reformative in aim, does make it clear that the State is not prepared to countenance certain activities. Secondly, there is the argument that it is a natural moral law that suffering should follow wrongdoing. This thesis clearly implies the existence of moral forces, and these must be independent of State activity. It is therefore irrelevant to the problem of legal punishment. From a practical angle the argument against the retributive theory is that no penal system can strike a balance that would make the punishment proportional to the moral culpability of the offence, since no human being can weigh

up the temptations and difficulties of another, or evaluate how much suffering a given punishment will cause a given individual. But a retributive system loses its only possible justification if there is no due proportion between suffering and moral culpability.

The more widely held view to-day is that punishment, if it contains a sufficient element of suffering, will tend to deter people from crime. It accepts the point of view of the 19th cent. Utilitarians that behaviour is based on a reasoned calculation of the pains and satisfactions that will follow any given action. But it is now recognised that behaviour is much less determined by pure reason than used to be believed, yet the theory is still regarded as applicable to the criminal, who is least likely to make use of reason in determining behaviour. Whether he is violent or merely weak and inadequate, his behaviour is largely instinctive and emotional without thought for the future.

Recognising the limited deterrent value of punishment, modern penologists have come to lay greater stress on methods of rehabilitation as the best contribution a penal system can make to the welfare of the community. It does not follow from this that punishments will become less severe. Re-education takes time, and is likely to be associated with longer sentences. This is illustrated by the introduction of Corrective Training for habitual offenders (see CRIMINAL LAW) and the replacement of the comparatively short prison sentence by the long period of Borstal Training (see BORSTAL), and most offenders dread a long period of loss of liberty far more than a sentence that involves greater physical deprivation but is shorter.

The practical aspect of P. is concerned with the study of the techniques of re-education within the penal system and of the penal institutions and their results. Until recently there has been little knowledge of the relative merits of different penal methods. Even when the statistical results are known, which is not always the case, it is still not possible to judge without further information whether differences in the success rates are due to the relative merits of the various methods, or to differences in the type of offender with whom they deal. A beginning of a further growth of knowledge has been made by the development of prediction tables.

These tables embody the actual results of a large number of cases treated in a particular way. Given a large enough sample, it is possible to determine by analysis and statistical calculation what characteristics and experience make an offender dealt with in this manner a good or a bad risk from the angle of rehabilitation: the conclusions can be checked by applying them to another comparable sample. Though these tables deal only with averages, they have been found by experience to be more reliable as a basis for prognosis than the subjective judgments of the staff who have handled the offenders.

The pioneer work in this connection has been carried out in the U.S.A. by Sheldon and Eleanor Glueck, but a notable contribution has been made in Great Britain by H. Mannheim and L. Wilkins in a study of prediction applied to Borstal boys. Developments on these lines supplemented by individual studies should help to make our methods more scientific and less based on guess-work than is now the case. Mannheim and Wilkins have brought out of the realm of guess-work into the realm of ascertained fact that given 2 boys showing equal risks of failure, the open Borstal is likely to be more successful than the closed, whilst the Gluecks have shown that, contrary to general belief, the nature and seriousness of the offence show little or no correlation with the chances of rehabilitation. Such knowledge sheds new light on the problems of P. See also PRISONS.

See A. C. Ewing, *The Morality of Punishment*, 1929; Rt Rev. W. Temple, *Ethics of Penal Action*, 1934; Dr H. Mannheim, *The Dilemma of Penal Reform*, 1939, and (with L. Wilkins) *Prediction Methods in Relation to Borstal Training*, 1955; S. and E. Glueck, *After-Conviction of Discharged Offenders*, 1945; S. Hurwitz, *Criminology*, 1952; H. Jones, *Criminology and the Penal System*, 1956.

Penrhos College, school for girls founded in 1880 at Colwyn Bay, N. Wales, and situated on the coast directly overlooking the sea.

Penrhyn, see BETHESDA.

Penrhyn (Tongareva), largest and most northerly of the lagoon is. of the Cook Group. The lagoon measures about 108 sq. m., and vessels of considerable size can enter. Copra and pearl-shell are the main products. Pop. in 1954, 574.

Penrith: 1. Mkrt tn and urb. dist. of Cumberland, England, picturesquely situated 18 m. SE. of Carlisle. It was an important Rom. junction station (*Voreda*) and later the cap. of Cumbria. In the par. churchyard are the Giant's Grave (twin sculptured crosses of late Saxon date with hogback stones) and the Giant's Thumb (remains of a 10th-cent. rose cross). There are ruins of a 15th-cent. castle. Queen Elizabeth I co-ed. grammar school was re-estab. in the 16th cent. P. is the centre of an important agric. dist. mainly devoted to livestock rearing, and has a large cattle and sheep mkrt; industries include agric. implements and brewing. Pop. 10,520.

2. Tn of Cumberland co., New S. Wales, Australia, in the R. Nepean valley at the foot of the Blue Mts. 34 m. W. of Sydney. Pop. 18,790.

Penrose, Elizabeth, see MARKHAM, MRS. Penry, John (1559-93), Puritan, b. Breconshire, studied at both Oxford and Cambridge. He was the printer of the 'Martin Marprelate' tracts, which attacked the episcopal structure of the Church of England. He was forced to flee to Scotland in 1590, and on returning to England was condemned to death and hanged. See also MARPRELATE CONTROVERSY. See life by W. Pierce, 1923.

Penryn, municipal bor. of Cornwall,

England, on Falmouth Harbour, 2½ m. NW. of Falmouth. It ships granite and trades in coal, cement, grain, timber, etc. It has also boat-repairing yards and light engineering industries. Here is the site of the ant. Glasney College. Pop. 4232.

**Pensacola**, co. seat and port of entry of Escambia co., Florida, U.S.A., on P. Bay, an inlet of the Gulf of Mexico, 55 m. ESE. of Mobile. Fort Barrancas defends the entrance to its excellent harbour. P. is a shipping, fishing, and wood-processing centre. Products include paper, wood, naval stores, ramie fibre, temperature instruments, concrete blocks, tiles, and beverages. A nylon plant is near. There is a major naval air station here, one of the world's largest. P. navy yard is at Warrington near by. Pop. 43,480.

**Penshurst**, vil. and par. of Kent, England, about 4 m. SW. of Tonbridge. Sir Philip Sidney was b. at Penshurst Place (1554). The house, parts of which date from the mid-14th cent., was granted by Edward VI to Sir Wm Sidney in 1552, and it has ever since been the home of the Sidney family. The lofty baron's hall, dating from 1340, has a fine timbered roof supported by 10 life-size figures in wood. The Elizabethan long gallery is hung with family portraits. P. Place is rich in portraits, especially of the 16th and 17th cents. with many important examples of the early Eng. school, though in many cases the names of the painters are not known. Among the portraits are those of Sir Philip Sidney and of Dorothy Sidney, afterwards Lady Sunderland, to whom, under the name of Sacharissa, Edmund Waller addressed many verses. Pop. (of par.) 1554.

**Pensions**. For a brief list. of old age P., see RETIREMENT PENSIONS. Full details of contributions and rates of present retirement P. are given under NATIONAL INSURANCE ACT (1946). For Civil Service P., see *Digest of Pension Law and Regulations of the Civil Service*, issued by H. M. Treasury, 1952. For Naval, Military, and Air Force P., see *Services Pay and Pensions*, Command Paper 9692, 1956. For pension schemes in the Commonwealth, see *Year Book of the Commonwealth of Australia*, *New Zealand Official Year Book*, *Canada Year Book*, *Official Year Book of the Union of South Africa*, etc. (ann.).

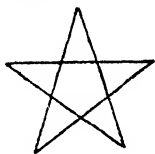
**Pensions, Non-Contributory, Retirement, and Widows'**, see NATIONAL INSURANCE ACT (1946).

**Pensions and National Insurance**, Ministry of. The Ministry of Pensions was estab. in 1916 for the purpose of unifying the administration of pensions, grants, and allowances awarded in respect of disablement or death through service in the Armed Forces; in 1939 provision was made for compensation to be paid in respect of war injuries sustained by civilians and members of the merchant navy. The Ministry of National Insurance was estab. in 1945 to assume responsibility for the introduction of the national insurance and family allowances schemes. In general, the national insurance schemes cover the whole pop. over school-leaving

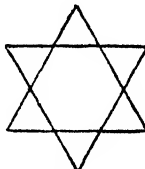
age and provide cash benefits for unemployment, sickness, maternity, retirement, and widowhood, and against the effects of industrial accidents and diseases. The Ministries of Pensions and National Insurance were merged in 1953.

**Pennett**, residential par. of Staffordshire, England, 2 m. SW. of Dudley. Pop. 7000.

**Pentacle, Pentangle, Pentagram, Pentagonon** (obsolete), or **Pentalpha**, figure of 5 straight lines forming a 5-pointed star. Found frequently in early ornamental art, it was used as a mystic symbol by the Pythagoreans, and later by astrologers and necromancers in the Middle



PENTACLE



HEXAGRAM

Ages. Together with the sign of the cross, it came to be used on doorways and thresholds as a charm to keep away witches and evil spirits. It should be formed without a break in the drawing. The hexagram (2 interlaced equilateral triangles), also used as a mystic symbol, is often confused with it.

**Pentacrinus**, stalked sea lilies (Crinoidea, q.v.). P.s were particularly numerous in the early part of the Liassic period, and are represented by still living species. The joints of the stem are pentagonal in outline. P.s occur on the floor of the deep ocean.

**Pentadesma Butyracea**, see BUTTER-TREE.

**Pentaglottis**, family Boraginaceae; genus of perennial herbs, of which P. (synonym *Anchusa*) *sempervirens* is the Green Alkanet, the one European species, naturalised in Britain.

**Pentagon**, the world's largest office building, on the Virginia side of the Potomac R., Washington, U.S.A. It was built (1941-3) to accommodate the increase in Amer. Army Dept personnel, and cost about \$64,000,000. The building brought all 3 services beneath the same roof, and approximately 32,000 workers were employed there. It is 5 storeys high, simple in style, and built round a 5-a.c. court, the perimeter of the building being nearly 1 m. There are 17 m. of corridors, and it possesses the largest private branch telephone exchange in the world. It is equipped with many cafeterias, a medical service, and a large library.

**Pentamerone**, II, or *Lo Cunto de li Cunti ovvero lo trattenimento de li Peccerille*, book of peasant fairy stories in Neapolitan dialect, collected and transcribed by Giambattista Basile, and pub. posthumously in 1637. This collection, the first of its kind, is divided into 5 days

each containing 10 tales, hence the name. The P. is of priceless interest to folklorists, retaining as it does all the freshness of the originals as heard from the lips of the people. The best ed. is that by B. Croce, *G. Basile ed il Cunto de li Cunti*, 1891. There is an Eng. trans. by Sir R. Burton, 1893.

**Pentane** ( $C_5H_{12}$ ), hydrocarbon of the methane series, existing in 3 isomeric modifications. Two of these, viz. P. (boiling point  $36^\circ C.$ ) and isopentane (boiling point  $30^\circ C.$ ), occur in petroleum, and are colourless mobile liquids. The third, tetramethylmethane (boiling point  $9.5^\circ C.$ ), is obtained by treating tertiary butyl iodide with zinc methyl. These isomers are volatile, inflammable liquids, which are, chemically, very stable. P. is one of the components of the petroleum ether, gasoline, petrol, etc., used as solvents for resins, oils, and caoutchouc, and for internal-combustion motors. P. is also used in the P. lamp as a standard in photometry.

**Pentateuch**, The (i.e. 'The Five Rolls,' though the Gk *teuchos* originally meant 'roll-case'). This name for the Five Books of Moses, the first 5 in the Bible, is first found in the 'Letter to Flora' of the 2nd cent. Gnostic, Ptolemy (Epiphanius *Adv Haer.* 33, 4, 1) and passed into Christian use; but among the Jews and in the O.T. and N.T. alike, these books are called 'the Law' (Torah), or the 'Law of Moses.' It was the constant belief until fairly recent times that the P. as a whole (though with slight modifications and additions, such as the account of the death of Moses in Deuteronomy) was the handiwork of Moses. During the 19th cent., however, the undoubted presence of doublets and repetitions in the narrative, accompanied by differences of style and a consistent variation in vocabulary, led critics (notably K. H. Graf and J. Wellhausen, q.v.) to analyse the P. into 4 distinct documentary sources, which had been combined and conflated by editors at different periods in Israel's hist. The present position in Pentateuchal criticism is one of flux, with a strong tendency in a traditional and conservative direction. See H. H. Rowley, *The Re-discovery of the Old Testament*, 1946; W. F. Albright, *The Archaeology of Palestine*, 1949; W. K. L. Clarke, *Concise Bible Commentary*, 1952. See also BIBLE; HEXATEUCH.

**Pentecost**, or **Shavuot** (Feast of Weeks), Jewish festival observed on Sivan 6 and 7, in the O.T. celebrating the end of the grain harvest 50 days after Passover, but also associated by the rabbis with the giving of the Ten Commandments on Mt Sinai. In ancient times first-fruits were then brought to the Temple. See also WHITE SUNDAY.

**Pentland Firth**, channel separating the Orkney Is. and Caithness, N. Scotland. It is 14 m. long and from 6 to 8 m. wide. There is a ferry, but strong tidal currents and whirlpools render navigation dangerous. The Pentland Skerries, 5 m. N.E. of Duncansby Head, include 2 islets, one of which has a lighthouse, and some rocks.

**Pentland Hills**, ridge in the Lowlands of Scotland, extending N.E. from the border of Lanarkshire, through Peeblesshire, through the centre of the co. of Midlothian and into the city of Edinburgh. The mean height is upwards of 1000 ft; the breadth 4 to 6 m. Scald Law (1898 ft) and Carnethy (1890 ft) are the highest peaks.

**Pentobarbitone**, see BARBITURATES.

**Pentstemon**, genus of perennial plants (family Scrophulariaceae), natives of N. America, bearing blue, purple, lilac, scarlet, rose, or yellow flowers, and of great value in the garden as border or rockery plants. They are raised from seed sown under cover in spring or from cuttings inserted in early autumn and kept through the winter in a cold frame. Hybrids between *P. cobaea* and *P. hartwegii* are the most popular garden sorts.

**Penza**: 1. Oblast in Central Russia, S.E. of Moscow, situated largely on the Volga uplands, in the black earth belt, and partly covered by oak forests. Area 16,700 sq. m., pop. c. 1,500,000, mainly Russians (since 17th cent.), also Moldavia and Tatars. Grain, potatoes, vegetables (Bessonovo onions), sunflowers, and hemp are grown, and cattle and hogs raised; there are also varied engineering, food, and textile industries. P. belonged to the Kazan Khanate, becoming Russian in 1552.

2. Cap., economic and cultural centre of the above. There are large precision and other engineering industries, also food industries. Important railway junction (4 lines). Pop. (1956) 231,000 (c. 1914, 80,000; 1920, 78,000; 1939, 157,000). Founded 1666 as a military and administrative centre. Old cultural centre of the black-earth belt (School of Horticulture founded 1822, School of Painting founded 1897).

**Penzance**, seaport and watering place of Cornwall, England, and centre of an important mrkt-gardenhg and agric. area, situated at the head of Mounts Bay, 8 m. ENE. of Lands End, and 20 m. WSW. of Truro. There are a good harbour and docks, and the climate is very mild. It is the nearest port (and only port of departure) to the Isles of Scilly, which are some 40 m. distant to the SW. P., with Newlyn, now incorporated in the bor., is a fishing centre; woollen yarns and cloths are manuf. also. St Mary's church was built in 1832 (the chantry of St Mary's was founded in 1284), on a site said to have been occupied by a castle built by the owner of the manor of Alverton. St Paul's church was built in 1843, in 13th-cent. style; St John's, in 1881, in the Early Eng. style; and the Rom. Catholic church was built in 1847. At P. is the museum of the Royal Geological Society of Cornwall; there is also a natural hist. museum, and in the Penlee Memorial Park is the art gallery. In front of the mrkt house (opened in 1838) is a marble statue of Sir Humphry Davy (1778-1829), the celebrated chemist, who was b. here. The name P. means 'holy head,' being derived from a chapel dedicated to St Anthony, which formerly

stood on a headland now forming the base of the old pier. In 1265 Madron par., including P., was appropriated by the Knights Hospitallers. In 1332 Edward III granted P. a weekly mkt and a fair of 7 days at the festival of St Peter. In 1512 Henry VIII gave P. a charter granting it ship dues on condition the tn maintained the quays in repair. The royal grant of its mkt was received in 1592 from Elizabeth I. Between 1595 and 1648 P. was pillaged 3 times. It was incorporated by James I in 1614. Three m. away in Mounts Bay is the world-famous St Michael's Mount, home of the St Aubyn family and often compared with Mt St Michel in France. The Mount is now owned by the National Trust. The bor. was extended in 1934; pop. 20,200.

**Peonage**, system of agric. labour prevalent in New Mexico and other parts of Sp. America; abolished by law in the former state in 1867. The name is derived from Middle Lat. *pedo* (from *pes*, foot). Originally a foot soldier, a *peon* came to mean a day labourer. The Indians, who hired themselves out to Sp. masters, or were bound to work for them because they were debtors or so-called criminal offenders, were called *peons*, but were really slaves.

**Peony**, see **PAEONY**.

**'People'**, Sunday newspaper, estab. in 1881, now owned by Odhams Press Ltd. It is independent in outlook, but politics are not an important feature. It features popular columnists and strong true-life series. The sale exceeds 4,750,000.

**People's Banks**, see under **CO-OPERATION**.

**'People's Democracies'**, the Communist regimes estab. after the Second World War in Poland, Hungary, Bulgaria, and other E. European countries. In these states the phrase is used, along with 'People's Republics,' as an official designation. The concept of democracy is very different from that held in W. Europe; 'people's' is intended to refer to the popular support on which these regimes are allegedly based. The 1956 revolutions in Poland and Hungary rejected Russian influence in or control of the Communist systems. Poland estab. a communist system under Polish control; Hungary revolted against both Russian influence and Communism itself. Popular support for Communism in other 'P. D.' was also questionable. Nor did the 'democracy' imply representative gov.; it referred to the *purpose* rather than the *method* of gov.: in theory, the 'P. D.' were run in the interests of the people; in practice, they were essentially authoritarian regimes run by bureaucracies.

**People's High Schools** (Denmark), see **FOLK HIGH SCHOOLS**.

**People's Palace**, see **QUEEN MARY COLLEGE**.

**Peoria**, city, cap. of P. co., Illinois, U.S.A., on Illinois R., the second largest city in Illinois, an air, rail, highway, and transportation centre and port of entry near a bituminous coalfield and in an extensive agric. area. P. is a grain and livestock mkt and distilling centre.

E.E. 9

There are manufs. of farm and road machinery, food products, furnaces, washing-machines, hardware, tools, sheet-metal products, wire, caskets, cordage, bricks, tiles, pottery, chemicals, corn products, cotton goods, strawboard; and also feed and oil refineries. P. is the seat of Bradley Univ. Pop. 111,900.

**Peperomia**, family Piperaceae, genus of about 400 ann. or perennial herbs of tropical or sub-tropical regions. *P. marmorata*, *P. metallica*, *P. sanderii*, of S. America, and others are grown ornamental foliage pot plants.

**Pépin**, or **Pippin**, name of sev. Carolingian rulers, the more important of whom are:

**Pépin the Elder**, (d. 639), also known as **Pépin of Landen**, who was mayor of the palace to Dagobert I of Austrasia. He was canonised and 21 Feb. was dedicated to him.

**Pépin le Gros**, or **Pépin d'Héristal** (d. 714), when Dagobert II d. (679) P. ruled Austrasia, subject to Thierry III, King of Neustria. During Thierry's reign he revolted, and by the victory of Testry (687) P. became master of the greater part of W. France and was recognised as *major domus* (mayor of the king's palace), which gave him power to rule the state. As mayor he ruled under Thierry, Clovis III, Childbert III, and Dagobert III. On the death of P. his son, Charles Martel (q.v.) succeeded to the mayoralty.

**Pépin le Bref (the Short)** (741-68), King of the Franks, was the younger son of Charles Martel and the father of Charlemagne. From 741 to 747 P. and his elder brother, Carloman, ruled conjointly under the puppet king, Childeric III; but in 747 Carloman entered a monastery, in 751 Childeric was compelled to abdicate, and P., with the aid of the Pope, was crowned first Carolingian King of the Franks. In 754 he aided the Pope against Aistulf, King of the Lombards; he forced Aistulf to give up Ravenna to the Pope, and by this act, which is known as the 'donation of Pépin,' laid the foundation of the temporal power of the papacy. He himself was made a 'patrician of Rome.' The rest of his life was spent in wars against the heathen Saxons, whom he tried to convert at the sword's point, against the Duke of Aquitaine, against Bavaria, and against the Saracens, from whom he recovered Narbonne.

**Pépin** (d. 810), son of Charlemagne, was crowned King of Italy by Pope Adrian in 781. He fought against the Avars, Slavs, and Saxons, drove the Saracens out of Corsica, and conquered Venice.

**Pépin I** (d. 838), son of Louis the Pious, was crowned King of Aquitaine at the age of 14. With his brothers he twice revolted against his father, and finally replaced him on his throne.

**Pépin II** (d. 870), son of the above, whom he succeeded as King of Aquitaine. He allied himself with Lothaire and took part in the battle of Fontenoy (841). He was deposed in favour of Charles the Bald by the treaty of Verdun, and until his imprisonment at Senlis (864) waged perpetual war against Charles.

\* 2

**Peploe, Samuel John** (1871-1935), painter, b. Edinburgh, educ. at Edinburgh Collegiate School and Univ. At the age of 20 he took up art, and studied in Paris and Edinburgh. His early pictures included still-lives experimenting with tones and sparing use of colour, and portraits whose dark backgrounds derived from Hals and Rembrandt. From 1905 his still-lives and Scottish landscapes acquired a luscious creamy quality; this, however, ended abruptly in 1910. In that year he married and went to France for 3 years. He was greatly influenced by Cézanne and the Post-impressionists, and his paintings of Cassis and Antibes began his third style, experimenting in bright colour planes, which he brought to his many later paintings of Iona. He was associate of the Royal Scottish Academy 1917, and full member 1927.

**Pepper, John Henry** (1821-1900), chemist, b. Westminster, associated with the optical illusion known as 'Pepper's ghost' (highly illuminated objects placed before plate glass so as to appear as if among less brilliantly lighted objects behind the glass), originally invented by Henry Dircks in connection with a piece by Dickens. P. was educated as a chemist, and studied analytical work in various laboratories. He wrote on scientific subjects in a popular fashion. Among his works are *The Boys' Playbook of Science*, 1878, and *The True History of Pepper's Ghost*, 1890.

**Pepper**, one of the most important spices: it is derived from a creeping vine (*Piper nigrum*) which is a native of the moist, low-country forests of Ceylon and S. India and has also been introduced into Malaya, Siam, as well as into Indonesia, and Borneo. Both 'black' and 'white' pepper are obtained from the same plant. P. contains an alkaloid (piperine), a volatile oil, an acrid resin, together with starch, gum, and albumin. The ash in ground black P. should not exceed 5 per cent, in white P. 3 per cent. Rice, linseed meal, bone dust, and other adulterants may be readily detected by the microscope. See also CAPSICUM.

**Peppercorn Rent**, nominal rent, in theory involving the ann. payment from lessee to lessor of one peppercorn; it was used in connection with long leases as a device for giving a leasehold the practical effect of a freehold.

**Peppermint** (*Mentha piperita*), small, slender, glabrous mint of the family Labiatae, with stalked serrate leaves and short spikes of flowers, the calyx of which is often red. The flowers are gathered in Aug., and after drying are distilled to yield the oil of P., which enters into the composition of P. water, the spirit of P., and P. cordial. Its medicinal value is as a stimulant and as a carminative.

**Pepperwort**. The Brit. P.s are species of *Lepidium*, a cruciferous genus. See also PIPERACEAE.

**Pepsin**, enzyme elaborated in the body by the gastric tubules. It has the property of causing chemical changes by which the proteins of the food material are converted into peptones. The P.

itself does not participate in the formation of the final products, and it cannot act except in conjunction with hydrochloric acid, which is also secreted by certain gastric glands. P. is also produced commercially by drying the mucous lining of the stomach of a pig or calf. If such an extract is added to food kept at the body temp., the proteins of the food are peptonised, and the resulting compound constitutes a food easily assimilated by persons of weak digestion. See ENZYMES; PROTEINS.

**Pepul**, see BO-TREE.

**Pepys, Samuel** (1633-1703), administrator and diarist, b. London, son of John P., a tailor. References in his diary show that S. P. was educ. at St Paul's School in London and at Magdalene College, Cambridge. In 1659, through the influence of his father's cousin, Sir Edward Montagu (later Earl of Sandwich), he entered the public service as a clerk of the exchequer, becoming clerk of the council in the same year, and began his *Diary*. In July 1660 he became a clerk of the Privy Seal and clerk of the 'Acts of the Navy.' He joined in the social life of the time, and managed to make a fortune out of the perquisites of his office; at the same time he made himself a thorough master of his business, and was a zealous reformer of abuses. In 1673 he became secretary for the affairs of the navy, and in the same year became M.P. for Castle Rising, exchanging his constituency for that of Harwich in 1679. A popular but erroneous estimate of P. is as 'a painstaking departmental official.' But in truth, P. carried out, at the Admiralty, in the teeth of opposition, drastic and far-reaching reforms. In 1679 the Admiralty Commission was dissolved and replaced by men wholly incompetent for their work. P. and Sir Anthony Deane, his close friend and former commissioner of the navy, having become involved in the unpopularity of the Duke of York, were accused of being Papists and were arrested and imprisoned in the Tower. They were acquitted, but after their release they had the mortification of being impotent spectators while the navy, in Anthony Deane's phrase, 'went to ruin.' And to P. a ruined navy meant a ruined England. Things went from bad to worse. From the 76 ships and 12,000 men of 1679 the navy dwindled to 24 ships and 3000 men by 1684, with empty yards, depleted stores, and sailors on the point of mutiny on being defrauded of their pay. P. urged, first on Charles II and then on James II, the project of a special commission for the recovery of the navy. James acceded, and P. overcame one difficulty after another, brought back Sir Anthony Deane from his retirement to assist, and in less than 3 years the effective strength was increased by 92 ships and the spirit and discipline of the men were restored. It is worthy of record that an Admiralty minute of 1805 spoke of P. as 'a man of extraordinary knowledge, of great talent, and the most indefatigable industry.' In 1689 a new charge of selling information to France led to his



retirement. His library was left to Magdalene College, Cambridge, where his *Diary* remained until 1819, when the Rev. J. Smith began to decipher it, and it was pub. by Lord Braybrooke in 1825. This *Diary* remains one of the most vivid and minute authorities for the events of the Restoration period, of the manners and scandals of the court, and of P.'s own interests and weaknesses. An ann. P. commemorative service is held at St Olave's, Hart Street, where he was buried. He pub. *Memoirs of the Navy*, 1690.



SAMUEL PEPPYS

The original MS. of the *Diary* is preserved in Magdalene College, Cambridge, to which P. bequeathed it, together with other papers; it is in 6 vols., containing upwards of 3000 pages, closely written in Shelton's system of shorthand, which P. doubtless adopted lest his jour. should fall into unfriendly hands during his life or be rashly pub. after his death. These facts are stated in the preface to the original and partial ed. of the *Diary* produced by Lord Braybrooke. Other eds. followed in 1828, 1848-9 (enlarged), 1854; a fuller ed. was pub. in 1875-9 by Mynors Bright, and in 1893-9 came H. B. Wheatley's practically complete ed. See H. B. Wheatley, *Samuel Pepys and the World he Lived in*, 1880, 1905; Sir F. Bridge, *Samuel Pepys, Lover of Music*, 1903; P. Lubbock, *Samuel Pepys*, 1909; E. H. Moorhouse, *Samuel Pepys, Administrator, Observer, Gossip*, 1909; J. R. Tanner, *Samuel Pepys and the Royal Navy*, 1920, *Mr Pepys: an Introduction to the Diary, together with a sketch of his later life*, 1925, and (ed.) 2 vols. of the correspondence of Pepys, 1926-9; A. Ponsonby, *Samuel Pepys*, 1928; and lives by J. Drinkwater, 1930, and A. Bryant, 1933-5.

Perak, most northerly of the states of the Federation of Malaya (q.v.), on the W. coast of the Malay Peninsula. Area 7980

sq. m. From Kelantan (q.v.) and from Pahang (q.v.) on the E. it is separated by the main range of granite mts that forms the backbone of the peninsula. The R. P. (170 m. long), the chief riv., flows between 2 parallel ranges (7000 ft) which traverse the state from N. to S. The chief exports are tin and rubber. Taiping is the cap. Iron ore, wolfram, kaolin are among the minerals besides tin. Rubber is the prin. commercial crop. Other crops are tea, the oil-palm, and rice, grown almost exclusively by Asiatics on small holdings. There are airports at Ipoh, Taiping, and Sitiawan. P. is ruled by a dynasty that claims descent from the last Malay Sultan of Malacca (q.v.). From 1650 onwards, the Dutch tried to obtain a monopoly of the tin exported from P., establishing near the mouth of the P. R. sev. factories, which the Malays destroyed. In 1765 the sultan made a treaty with the Dutch. Brit. influence began in the 19th cent. A treaty with Penang (q.v.) in 1818 secured to Brit. subjects the right to free trade in P. In 1826 the sultan ceded to the British the Dindings and the is. of Pangkor as posts for the suppression of piracy, and agreed to rely solely on the protection of Great Britain. Anarchy prevailed for a time owing to fighting between rival Chinese factions over the tin deposits and, in 1874, Sir Andrew Clarke, governor of the Straits Settlements, induced the P. chiefs to sign the Pangkor Treaty, and to accept a Brit. resident whose advice should be taken on all questions other than those concerning Muslim religion and custom. By an Act of 1934 the ter. of the Dindings was restored to P. In Dec. 1941 the state was overrun by the Jap. invaders and held till the surrender of 1945. The present Sultan of P. succeeded to the throne in 1948. His seat is at Bukit Chandau. He was an official guest at the coronation of Queen Elizabeth II in 1953. Pop. 1,186,000.

Perambulation, see BOUNDS, BEATING THE.

Perambulator, see BABY CARRIAGE.

Perameles, see BANDICOOT.

Percentiles, see MENTAL TESTS.

Perceval, Sir, hero in one of the legends of the Arthurian cycle. According to the oldest version, P. was the son of a widowed mother brought up in obscurity, but fired with a love of knightly deeds by an accidental meeting with Arthur's knights. This legend probably first became confused with the legend of the Holy Grail in the romance of *Perceval le Gallois*, begun by Chrétien de Troyes, continued by Wauchier de Denain and Gerbert, and finished by Manessier (see GRAIL). It is this version which is used in by far the finest setting of the legend, in Wolfram von Eschenbach's *Parzival*, c. 1216, on which Wagner based the libretto of the last of his operas. For the Welsh theory see Sir J. Rhys, *Studies in the Arthurian Legend*, 1891; for the P. legend, as distinct from the Grail, see *Syr Percyvelle of Galles* (ed. J. Halliwell), 1884; 'Peredur, Son of Eirawr,' in the *Mabinogion* of Lady C. Guest, 1879;

W. W. Newell, *Legend of the Holy Grail*, 1902; J. L. Weston, *Legend of Sir Percival*, 1906; J. D. Bruce, *Evolution of Arthurian Romance to 1300*, 1923-4; W. Gother, *Parzival und der Gral in der Dichtung des Mittelalters*, 1925; and E. G. Gardner, *The Arthurian Legend in Italian Literature*, 1930.

**Perceval, Spencer** (1762-1812), statesman, educ. at Harrow and Trinity College, Cambridge; he practised at the Bar until 1796, when he entered Parliament. He held office under Addington, and was chancellor of the Exchequer under Portland (1807). He became Prime Minister in 1809, and was assassinated on 11 May 1812 in the lobby of the House of Commons by John Bellingham, a merchant, who attributed his bankruptcy to the gov. measures. See life by Sir Spencer Walpole, 1874.

**Perch** (*Perca fluviatilis*), common Brit. type of a large family of spiny-finned fishes. It prefers still waters, and only in them is it able to spawn. The greatest weight of *P. fluviatilis* on reliable record is 10 lb. It is a bright-looking fish, and very conspicuous from above by the vertical, dark bars extending from the back down the sides. It is rough to the touch. The flesh, though firm and white and free from a muddy flavour, is not appreciated in Britain as it is in Russia and elsewhere.

**Perch** (measure), see METROLOGY.

**Perch**, Climbing, or *Anabas scandens*, fish which is noted for its ability to travel overland by means of its spines. It was believed to climb trees by the same organs, and has been found up trees in India, but it is placed in the branches by such birds as crows and kites.

**Percheron Breed**, see HORSE.

**Perchloric Acid** ( $\text{HClO}_4$ ) is prepared by distilling strong sulphuric acid with potassium perchlorate under reduced pressure. It is a colourless, volatile, strongly fuming liquid (sp. gr. 1.782 at 15°C.), and is a powerful oxidising agent, a drop of the liquid instantly decomposing if dropped upon wood or charcoal, sometimes explosively. The salts of this acid are the perchlorates, all of which are soluble in water. Potassium perchlorate is prepared by heating the chlorate.  $4\text{KClO}_3 = \text{KCl} + 3\text{KClO}_4$ . The salt is purified from the chloride by crystallisation, the solubility of the perchlorate being about 0.7 part in 100 parts of water at 0°C.

**Percival, Arthur Ernest** (1887- ), Brit. gen. Educ. at Rugby, Lieut.-Gen. P. served in the First World War with the Beds. and Essex Regts. and in 1919, then a captain, took part in the N. Russian expedition. From then until 1936 he held a series of regimental appointments. In 1936 he was given a staff appointment in Malaya, which he held until 1938, when he became a Brigadier at Aldershot. He served with the B.E.F. in 1939-40, and in 1941 was sent out to Malaya as G.O.C. He commanded the Brit. forces during the Jap. invasion and was captured when Singapore fell in 1942. He retired from the Army with the rank of Lieut.-gen. in

1946. He wrote *The War in Malaya*, 1949.

**Percival, John** (1834-1918), headmaster and bishop. Son of a Westmorland farmer, he had a strenuous boyhood. In his twenty-first year he won an open scholarship at Queen's College, Oxford, of which later he was a fellow. P. accepted a post as master at Rugby (1860) and in 1862, on the recommendation of Frederick Temple (q.v.), he was appointed first headmaster of Clifton College, which was then a struggling foundation. P., who shared Arnold's views, soon raised the college to be one of the great public schools. When looking for a master for the modern side of the school, he chose the poet and divine, Thomas Edward Brown (q.v.). His success was due in no small measure to his large-heartedness and public-spirited character, and his ascendancy over the parents was as great as that over the boys. He was also a prime mover in the foundation of Somerville College. In 1879 he left Clifton to become president of Trinity College, Oxford; though too impatient for reforms, he left a strong impress on the college. He was also a pioneer of the Univ. Extension movement. In 1886 he accepted the headmastership of Rugby, and in 1895 the bishopric of Hereford. A strong Liberal, his opinions on eccles. and political questions were not necessarily shared by the diocesan clergy, and P. was almost too earnest an advocate of all that appealed to him. See life by W. Temple, 1921.

**Percussion**, or *Tapotement*, mode of diagnosis in medicine, which, as its name implies, involves tapping and the eliciting of sounds. It was used by Corvisart for examining cases of heart disease, and was developed by Laennec. Other physicians have made it of great value in diagnosing lung, heart, and abdominal diseases, and in delineating the margins of solid and hollow organs. The affected part is tapped with the three first fingers, or with a small rubber-tipped hammer, or, more usually, the fingers of one hand are laid flat and close on to the body surface and are tapped by the second finger of the other hand. Hollow organs give a resonant note and solid organs a dull, flat note.

**Percussion**, Centre of, see CENTRE OF PERCUSSION.

**Percussion Caps**, originally small copper cylinders holding a detonating powder, e.g. a mixture of fulminate of mercury with powdered glass, antimony, sulphide, and potassium chlorate. These can be exploded by percussion, and so are used in firearms. See FULMINATES; FIREARMS. Modern caps omit the potassium chlorate, as it is the prime source of corrosion in weapons.

**Percussion Instruments**. All musical instruments played by being beaten are called P. I., including all varieties of drums, bells, cymbals, triangles, castanets, gongs, etc., also some in which the percussion is produced by the intermediary of a keyboard, such as the celesta. These last instruments, as also bells, xylophone, and kettledrums, produce

notes of definite pitch; others produce sound without pitch and thus, strictly speaking, merely a kind of refined and organised noise.

**Percy**, noble Anglo-Norman family. Its head, Wm de P., accompanied the Conqueror to England, and received large estates in N. England. The wealth and importance of the P.s was greatly increased by marriage with the heiress of Brabant, whose arms they subsequently used. One of the family assisted in obtaining Magna Carta, and the ninth lord (the first to be summoned to Parliament) signed the barons' letter to the Pope (1301). His great-grandson became marshal of England under Richard II, and was made earl of Northumberland (1377). He distinguished himself against the Scots, and took Berwick. When Bolingbroke assumed the crown, with the title Henry IV, he created the earl constable of England. In the fourth year of that reign, the earl and his son, Sir Henry P., nicknamed Hotspur, defeated the Scots at Halidon Hill, and took the earl of Douglas prisoner. Later the earl rebelled against the king, and put Hotspur at the head of his troops; but Hotspur was slain at the battle of Shrewsbury in 1403; upon which P. made his submission and received the royal pardon. Later, however, he collected another army, but was defeated and slain in Yorkshire in 1408. Henry V restored the title to a son of Hotspur. The second earl was slain at the battle of St Albans in 1455; and the third at Towton, in 1460. The fourth earl was murdered while trying to collect a subsidy on behalf of Henry VII, the fifth and sixth earls d. in 1527 and 1537 respectively. The seventh was beheaded in 1572, the eighth found shot in the Tower, 1585. The ninth earl spent 15 years imprisoned in the Tower. The tenth earl fought first against Charles I and then helped in the Restoration. The P. family is now represented only in the female line, the male line having died out with the eleventh earl, who left an only daughter who married the Duke of Somerset, the title Duke of Northumberland (created in 1766), then passing through their son Algernon to his son-in-law, Sir Hugh Smithson, who became duke in 1766. His son Hugh took the name of P.; from him the present tenth duke is descended. Baron Percy of Newcastle (1887-1958) was a son of the seventh duke. As Lord Eustace P. he was an outstanding President of the Board of Education, 1924-29, and was created Baron P. in 1953 in recognition of his public services. See G. Brennan, *History of the House of Percy* (ed. W. A. Lindsay, 1902).

**Percy**, Esmé (1887-1957), actor and theatrical producer, b. London, studied at the Brussels Conservatoire and first appeared with F. R. Benson's company at Nottingham in 1904. His début in London was in *Romeo and Juliet* in 1905 and in New York in *The Red Planet* in 1932. He played many prominent roles and is remembered for his interpretation of the leading parts of many of

Shaw's plays, with Charles Maadonna's Bernard Shaw Repertory Company in London and the provs.

**Percy**, Thomas (1729-1811), scholar, antiquary, and poetical collector, b. Bridgnorth, Shropshire. Educ. at Christ Church, Oxford, he became Bishop of Dro-more, Ireland, in 1782. The friend of Johnson and Goldsmith, he pub. trans. from the Icelandic, a new version of the Song of Solomon, 1764, *The Household Book of the Earl of Northumberland in 1512*, 1768, and a trans. of Mallet's *Northern Antiquities*, 1770. His most popular and famous work was the *Reliques*



BISHOP PERCY

of *Ancient Poetry*, 1765, which was composed of old heroic ballads and songs, together with a few modern imitations by the editor. This work, which was warmly and justly praised by the critics, was chiefly obtained from an old folio MS., together with additions from the Pepys collection at Cambridge, the Ashmole Library at Oxford, the Brit. Museum, and works of early poets. The collection was of great value to our literature, recalling the public taste to the rude energy, picturesque, and passion of the old chivalrous minstrels and Elizabethan songsters. The work inspired Sir Walter Scott's *Minstrelsy of the Scottish Border*. See A. C. C. Gausson, *Percy, Prelate and Poet*, 1908, and T. Shearer and A. Tillotson, *Percy's Relations with Cadell and Davies*, 1934.

**Percy Anecdotes**, originally pub. in 40 monthly parts, commencing in 1820, were compiled by 'Sholto and Reuben Percy, brothers of the Benedictine Monastery of Mount Benger.' This was really a pseudonym. 'Reuben Percy' was Thomas Byerley, the first editor of the *Mirror*, and 'Sholto Percy,' Joseph Clinton Robertson, he founder and first editor of the *Mechanics' Magazine*. The name originated from the fact that the 2 authors used to meet and talk over the book at the Percy coffee house, in Rathbone Place.

**Perdiccas**, 4 Macedonians:

**Perdiccas I** was a native of Argos in the 8th cent. bc. With 2 of his brothers he conquered a large part of Macedonia and founded the Macedonian dynasty.

**Perdiccas II** reigned in Macedonia from about 454 to 413 bc. During the Peloponnesian war he allied himself first with the Athenians and then with the Spartans, betraying both parties.

**Perdiccas III** reigned in Macedonia from 364 to 359 bc. Aided by the Athenian Iphicrates, he overthrew the regent Ptolemy. Later he made war against the Athenians, and fell in battle against the Illyrians.

**Perdiccas IV**, one of the most famous Macedonian generals under Alexander the Great, whom he accompanied into Asia. He became chief minister of Alexander's successor, Arrhidæus; but his rivals, Antipater, Antigonus, Craterus, and Ptolemy, conspired against him. While marching against Ptolemy he was murdered at Memphis by his own soldiers (321 bc).

**Pereda, José María de** (1833-1906), Sp. novelist, b. Polanco, near Santander. After a few years in the artillery he retired to his country estate. His novels, written in excellent and virile style, are pictures of the follies of his contemporaries, more particularly descriptions of persons and places of his native Santander. His novels include *Escenas Montañesas* (2 series, 1864, 1871); *Sotileza*, 1884, a story of the sailors and fishermen, of Santander; and *Peñas Arriba*, 1894, about a small mountain village. His *Don Gonzalo Gonzalez de la Gonzalera*, 1879, is a politico-social satire. See J. M. de Cossio, *La obra literaria de Pereda*, 1934; J. Camp, *J. M. Pereda, sa vie, son œuvre et son temps*, 1937; R. Gallón, *Vida de Pereda*, 1944.

**Peregrine Falcon**, see FALCON.

**Pereira, José Maria dos Reis**, see RÉGIO, JOSÉ.

**Pereira**, tn of W. Colombia, cap. of the dept. of Caldas, 40 m. by rail from Manizales. It is a centre of the coffee and livestock industries. Pop. 31,000.

**Perekop** (anc. Gk Taphros), vii. (until 1925 tn) on P. Isthmus between Crimea and mainland. There are traces of Gk fortifications. It was a Tatar fortress from the 15th cent., and has been Russian since 1783. There was heavy fighting here in 1920 (Russian Civil War), 1941, and 1943-4.

**Père-Lachaise**, Fr. cemetery, well known because of the great number of celebrated persons buried in it. It is at Ménilmontant, in E. Paris, and was opened in 1804 on an anc. property of Père la Chaise, confessor of Louis XIV. It contains the tomb of Abélard (q.v.) and Héloïse.

**Perennials** are plants with roots that are able to live for a number of years by storing up a supply of reserve food. Usually the part above ground dies down. Trees and shrubs store their reserves in the parenchyma of the cortex and medullary rays in the stems. See GARDENING.

**Pereyaslav-Khmel'nitskiy** (until 1943

**Pereyaslav**, tn in the Kiev Oblast of the Ukraine, 42 m. S.E. of Kiev. It has been known since 907, and was cap. of P. principality 1054-1239. The Ukrainian Cossack assembly in P. acknowledged the supremacy of the Tsar of Muscovy in 1654. Pop. (1935) 17,000.

**Pérez de Ayala, Ramón**, see AYALA, RAMÓN.

**Pérez de Guzmán, Fernán** (1378-c. 1460), Sp. poet and chronicler, nephew of Ayala (q.v.). Among his works are *Crónica del rey Juan II* (pub. 1779); *Generaciones y semblanzas* (pub. in 1779), an account of the illustrious men of his time, in terse and brilliant style; *Loores de los claros varones de España*, a rhymed chronicle. His poetical works consist mainly of hymns and moral pieces.

**Pérez de Montalbán, Juan** (1602-38), Sp. dramatist, b. Madrid. Under the influence of his friend, Lope de Vega, he wrote *Orfeo*, 1624. His prose *Vida y purgatorio de San Patricio*, 1627, was the foundation of Calderón's play. The best known of his plays is *Los Amantes de Teruel*, 1638. He wrote the first biography of Lope de Vega.

**Pérez Galdós, Benito**, see GALDÓS.

**Perfectionism** of Christians, doctrine held by the Wesleyan Methodists (see METHODISM) of a Christian perfection attainable in this life. It is not a perfection of justification, but a perfection of sanctification, which John Wesley, in a sermon on Christian Perfection, from the text Heb. vi. 1, 'Let us go on to perfection,' earnestly contends for, as attainable in this life by believers. Theosophists and Buddhists generally believe that absolute perfection can (under certain very stringent conditions) be attained to in the course of the one life.

**Perfectionists**, see BIBLE COMMUNISTS.

**Performance Tests**, see MENTAL TESTS.

**Performing Animals (Regulation) Act**. Every person who trains or exhibits performing animals must hold a certificate of registration issued by a local authority. Registration with any local authority is valid throughout the country. Offences against this Act or the Protection of Animals Act may result in the cancellation of registration.

**Performing Right Society**, association of composers, authors, and publishers of copyright musical works, estab. in 1914 to collect fees for the public performance of such works, and to restrain unauthorised performances thereof. The constitution is that of a company limited by guarantee.

It makes no profits for itself, pays no dividends, and charges its members no agency commission, no entrance fees, and no subscriptions. All fees collected, and all receipts from other sources, are distributed among the composers, authors, and publishers concerned, in proportion to the extent of public performance of their works. No expenses are deducted from the fees beyond the cost of administration, which is less than 10 per cent of the gross sum collected. By virtue of affiliations with some 30 similar societies in other countries the society is able to grant to those concerned with public performances

of copyright music in the Brit. Isles and overseas Brit. ters. comprehensive licences which cover a repertoire comprising not only the works of its own members, but also those of members of the affiliated societies, numbering more than 75,000 composers, authors, and music publishers of all nationalities. The same affiliations ensure the protection of P. K. S. members abroad. The society's policy and administration are controlled by a board of directors elected by the members from among their own number. The board (unpaid) consists of 12 representative Brit. composers and authors and an equal number of music publishers. The operations of the society extend only to musical works. It is not concerned with the performance of non-musical plays or sketches, or with operas, musical plays, or other dramatico-musical works when performed in their entirety by living persons on the stage.

**Perfumery.** Perfumes are the essences, obtained from plants chiefly, to which the flowers, leaves, etc., owe their fragrant odours; the art of P. deals with the extraction and properties of those essences and their preparation in convenient form for toilet purposes or industrial use. Gum resins have been in use from very ancient times; they are widely used as fixatives in perfume compounds to give a uniform smell throughout to the finished blend, and to retard the volatility of the odorous components, thus rendering the perfume more tenacious. The true perfumes are essential or volatile oils (Fr. *otto*), contained in minute sacs in the leaf, as in mint; in wood, as in sandalwood; in bark, as in cinnamon; in seeds, as in nutmeg; in rind of fruit, as in lemon; in petals of flowers, as in rose and lavender; or, as in the case of orris, in the rhizome. The extraction of the oil is performed in sev. ways. The process known as enfleurage consists of exposing the flowers in contact with purified lard or with fine olive oil in suitable frames, whereby the fatty substances take up and become impregnated with the essential oil. Like the process of maceration, enfleurage depends for its efficacy upon the remarkable property which fats and oils possess of absorbing odours. In other cases the aroma is caught in pure olive oil contained in felt placed above the flowers. Jasmine and tuberose are best prepared by enfleurage. In the process of maceration, warm oil or melted fat is prepared, and the blossoms infused for sev. hours. Rose, orange, and acacia are best prepared by maceration, the jonquil and violet by the combined processes. The oils and fats produced are treated with pure absolute alcohol, which absorbs the essential oils and is decanted. In other cases the flowers are placed in water in a still, when the oils are carried off with the steam and collect on the surface of the water, from which they are siphoned off. This is the method employed with woods, barks, seeds, etc. Oil may in some cases, where it is present in large quantities, as in lemon and orange peel, be pressed out. The amount of perfume obtained varies

with the species of flower and also with the season. More than one odour may be obtained from the same plant; in the case of the orange, the fruit yields Portugal oil, the flower a distinct odour, neroli, and the leaves, *petit grain*. The essential oils are all soluble in alcohol (usually acetone free), and this solution, care being taken that the alcohol is itself odourless, forms the usual 'scent.' Sometimes the oils and alcohol are distilled together. The best perfumes, however, are produced by steeping the pomades and oils from the enfleurage process for sev. weeks at a gentle warmth. In the case of ambergris, castor, civet, musk (qq.v.), etc., the oils are formed into a tincture by solution in alcohol. Sev. terms are in common use. *Extrait* is strong solutions of the oils in alcohol after the process of infusion. They may be simple or blended. *Esspris* are weaker solutions. *Essences* may be the volatile oils themselves, or strong solutions of them. The terms *bouquet* and *rosegay* are applied to blended perfumes which have no one distinctive flower odour. Of animal perfumes there are only 4 in use: musk, civet, ambergris, and castor (castoreum). All are extremely powerful; musk, for example, will impart odour to polished steel, though it will itself lose all fragrance within a year. Civet is even more potent than musk, and both are insupportable when strong. Castor is reddish-brown, and is used in the dilute state. Ambergris from the whale has a musky odour. They are all used in very dilute states, or merely to provide a base for bouquets.

**Artificial Perfumes and Flavours.** Synthetic chemistry has been successful in the preparation of artificial substances with practically the same perfumes and other characteristics as the natural products; in other cases products with similar perfumes but in many respects different. Terpineol, one of the commonest aromatic synthetics used in P., is the basis for lilac, lily, and many other compounds, the proportion being as much as 10-50 per cent in lilac. It is made synthetically by the action of diluted acids on oil of turpentine with continued stirring for many hours to yield terpin hydrate and afterwards terpineol. Oil of cassia is mainly cinnamic aldehyde,  $C_9H_7CH=CHO$ , which may be prepared from benzaldehyde or by heating the formate and cinnamate of calcium together. Vanilla, from the pod of the vanilla bean, can now be synthesised in the laboratory. Coumarin, the perfume of tonka beans, prepared from o-cresol, through salicylaldehyde; anisic aldehyde is a substitute for the perfume obtained from hawthorn. From the esters and ethers other substitutes are prepared; from xylene through its *meta*-tertiary-butyl derivative: Xylol Musk (trinitro-tert.-butyl-m-xylene) with a musky odour is produced and used in soap manu. Bromostyrolene is a substitute for hyacinth oil; from naphthalene the methyl ether of naphthol,  $C_{10}H_7(OCH_3)$ , or nerolin, is produced as a substitute for neroli oil; other substitutes for this are methyl anthranilate from benzoic acid and

the ethyl ether of naphthol, bromella; niobe oil is substituted by the synthetic methyl benzoate; jasmine oil by benzyl acetate from benzene. Other synthetic perfumes of great importance are the aldehydes ranging from  $C_6$  to  $C_{18}$ . A few examples are:  $C_6$ , hexyl aldehyde (fruity note);  $C_9$ , decyl aldehyde (orange-like odour);  $C_{11}$ , methylnonylacetic aldehyde (when diluted smells of oranges and amber);  $C_{12}$ , peach aldehyde (gives a lasting odour of ripe peaches);  $C_{14}$ , strawberry aldehyde (powerful smell of strawberries);  $C_{15}$ , raspberry aldehyde (raspberry odour and used as such in flavouring). These possess, in concentrated form, a very powerful odour and should be used in 1-10 per cent solution. Sometimes as little as 1:10,000 can alter the original note of a perfume blend.

As perfumes such substitutes are quite satisfactory, but as flavours they are rather to be deprecated, since they replace, though probably the main active constituent, none of the secondary organic constituents and micro-organisms present. Beyond the general use as scents, perfumes are in use in various powders and dentifrices, in the manu. of tobacco, as well as for flavours in some cases. In recent years much attention has been paid to methods of synthesising some of the more complex natural perfumes such as musk and violet perfumes. Mention may be made of Ruzicka's work on musk and irone (1926-47). See also ATTAR and EAU DE COLOGNE. See G. Plesse, *Art of Perfumery*, 1862; also trans. of K. Khristov, *Rose Industry of Bulgaria*, 1890; E. Sagarin, *The Science and Art of Perfumery*, 1946; Y. R. Naves and G. Masuyer, *Natural Perfume Materials*, 1947; and T. F. West, H. J. Strausz, and D. H. R. Barton, *Synthetic Perfumes*, 1949.

**Perga**, anct city, the ruins of which are situated in the prov. of Konia, Asiatic Turkey, 12 m. NE. of Adalia. An important city of Pamphylia, it was famous for the worship of Artemis and was visited by St Paul on his first missionary journey.

**Pergamino**, tn of Argentina, in the dept of Buenos Aires, 141 m. from the city of Buenos Aires and 65 m. S. from Rosario. It is an important railway centre, and sev. branches of the Bartolomé Mitre Railway radiate from the tn. There is an agric. research station. Pop. 31,000.

**Pergamum**, or Pergamus. The former is by far the most usual form in the classical writers, though the latter is more common in Eng., probably on account of its use in our version of the Bible, Rev. ii. 13. (1) The citadel of Troy, and used poetically for Troy itself; the poets also use the forms Pergama and Pergamia. (2) Celebrated city of Asia Minor, the cap. of the kingdom of P., and afterwards of the Rom. prov. of Asia. The kingdom reached its greatest extent after the defeat of Antiochus the Great in 190 BC, when the Romans bestowed upon Eumenes II the whole of Mysia, Lydia, both Phrygia, Lycaonia, Pisidia, and Pamphylia. It was under the same king that there was

founded at P. the celebrated library which for a long time rivalled that of Alexandria, and the formation of which occasioned the invention of parchment, *charta Pergamena*. On the death of Attalus III in 133 BC, the kingdom, by a bequest in his will, passed to the Romans. Among the celebrated natives of the city were the rhetorician Apollodorus and the physician Galen. The altar of Zeus and the statue of the dying Gaul were fine examples of stonework. The modern name is Bergama. See E. V. Hansen, *The Attalids of Pergamum*, 1947.

**Pergola** (It.), an arbour or walk covered with creepers; and constructed of trellis-work; or of brick piers or wooden posts, with wooden joists over them.

**Pergolesi, Giovanni Battista** (1710-36), It. composer, b. Jesi near Ancona. His parents were poor, and he seems to have been sent to Naples to study at the Conservatorio del Poveri, under the patronage of Marchese Planeti, where his masters are said to have been Mattei, Greco, and Durante. In 1731 a kind of stage oratorio of his was performed, and in the following winter his first opera, *Salustia*. In 1732-4 P. was *maestro di cappella* to the Prince of Stigliano at Naples, for whom he wrote cantatas and chamber music. In 1734 he took a similar post in the household of the Duke of Maddaloni. A Mass performed with success in Rome led to the commission for an opera there, but *L'Olimpiade* was a failure in 1735, and he returned to Naples in very poor health. He went to Pozzuoli in Feb. 1736 in the hope of recovering, but was in the last stages of consumption and d. there on 16 Mar., leaving Masses, the famous *Stabat Mater* and other church music, secular cantatas, oratorios, some instrumental works, and 9 operas, 3 of which, including *La serva padrona* are only comic *intermezzi* to be performed between the acts of a serious opera. A great deal of music attributed to him after his death is now known to be spurious, so that his output is far smaller than had long been believed, but nevertheless astonishing enough for a composer who suffered from ill-health and died at the age of 26.

**Peri, Jacopo** (1561-1633), It. composer, b. Rome and fl. at Florence, where he was an intimate of the coterie of artists and writers, patronised by Counts Bardi and Corsi, who sought to revive the Gk drama. In music this group of progressives discarded counterpoint and cultivated melody and the harmonic aspect of music. P., with Caccini, experimented in musical declamation to a suitable accompaniment, and thus became the earliest composers of recitative. They may also be claimed to have been the world's first operatic composers. P.'s opera *Dafne* (1597) is lost, but his *Euridice* (1600) is extant.

**Peri**, see PARI.

**Periander**, statesman of Corinth (q.v.), son of Cypselus, whom he succeeded as tyrant 625 BC, and reigned 40 years, to 585 BC. His rule was mild and beneficent at first, but afterwards became oppressive. He was commonly reckoned among the

Seven Sages. He was responsible for the foundation of Macedonian colonies, and was a patron of literature and art.

**Perianth**, strictly the envelope or non-essential parts of a flower, even when these parts are clearly separable into calyx and corolla, but commonly used where calyx and corolla so closely resemble one another as not to be distinguishable, as for instance in the tulip and other Liliaceae. The function of the P. is to protect the stamens and pistil from wind and rain until after pollination. Usually it is brightly coloured to indicate to insects the presence of nectar. It is absent from a number of wind-pollinated plants, e.g. grasses and willows.

**Pericarditis**, see CARDITIS.

**Pericardium**, see HEART.

**Pericarp**, the rind or shell of fruits (q.v.).



PERICLES

**Pericles** (c. 490-429 B.C.). Athenian statesman, son of Xanthippus and Agariste. His father commanded the Athenian fleet at Mycale in 479. P. received his higher education under the sophist and musician Damon, and the philosopher Anaxagoras (q.v.), who became his closest friend. By 469 P. was regarded as leader of the democratic party in opposition to Cimon (q.v.). In 461, through the medium of his friend Ephialtes, he carried a measure to restrict the power of the Areopagus, and secured the ostracism (q.v.) of Cimon. P. likewise enjoyed the confidence of his fellow citizens as a military commander, and his most outstanding successes in this field were the recovery (446) of Euboea, which had revolted from Athens, and the reduction of Samos (440). After the death of

Cimon (449) the aristocratic party was led by Thucydides, son of Melesias; but on the ostracism of Thucydides in 443 P. was left without a rival. He spent the years 440-432 beautifying Athens (q.v.) with public buildings. Meanwhile his enemies did their best to destroy his reputation; but failing in this, they attacked him through his friends. Pheidias, Anaxagoras, and P.'s mistress Aspasia were all denounced. The great sculptor went into exile after a trumped up charge of impiety; the philosopher was ordered to pay a heavy fine and to leave Athens; Aspasia also was accused of blasphemy, and was saved only through the entreaties of her lover. On the outbreak of the Peloponnesian war (431), which P. had long foreseen, he urged the Athenians to rely wholly upon their sea-power; and their neglect of that advice led to ultimate disaster. At the end of the first year's campaign P. delivered the celebrated funeral oration which forms perhaps the most memorable statement of Athenian values and aspirations (Thucydides, ii). In the summer of 430 plague broke out in Athens, carrying off his two sons Xanthippus and Paralus, and most of his intimate friends, besides demoralising the people. P. died in the following year. Renowned for his dignified bearing and splendid eloquence, he was also a man of unimpeachable honour and courage. Under his leadership Athens attained the zenith of her artistic glory, of her imperial greatness, and of her commercial prosperity. See also GREECE, History; PELOPONNESIAN WAR. See Thucydides, i and ii; A. R. Burn, *Pericles and Athens*, 1949.

**Peridotites** are coarsely crystalline, ultra-basic igneous rocks, occurring generally as intrusive masses. They contain little or no feldspar, but consist chiefly of olivine (peridot), with augite, enstatite, diopside, and magnetite. In composition they approximate to some meteorites. Special varieties have received distinctive names, such as picrite, dunite, serpentine. Although holocrystalline when fresh, the rocks are generally altered, the altered rock being known as serpentine.

**Périers**, Bonaventure des, see DES PÉRIERS, BONAVENTURE.

**Périge**, position in the orbit of the moon (or sun) that is nearest the earth. See APHELION; APOGEE.

**Pérignon**, Dom Pierre (1638-1715), Fr. Benedictine monk, born at Ste-Menehould. He is the reputed originator of sparkling Champagne (see CHAMPAGNE WINES; ÉPERNAY).

**Périgord**, dist. of France, in the N. of the ant. prov. of Guyenne (q.v.). It was united to the Crown by Henry IV in 1589. It now forms part of the depts of Dordogne and Lot-et-Garonne.

**Périgueux**, Fr. tn, cap. of the dept of Dordogne, on the Isle. It is the seat of a bishopric, has Rom. remains, and many ant. buildings, including a Romano-Byzantine cathedral. There are railway workshops, tanneries, and food-canning factories, and a trade in truffles, grain, and wine. Pop. 41,000.

**Perihelion**, point in the orbit of a comet or planet (including the earth) at which it is nearest to the sun. See APHELION.

**Perim**, is, in the strait of Bab-el-Mandeb, 1½ m. from the coast of Arabia, and 96 m. W. of Aden, from which it is administered. The British occupied it in 1857 because of the Suez Canal and it remained a coaling station until 1936. There is no fresh water and little vegetation.

See also ADEN.

**Perineum**, that part of the external floor of the pelvis (q.v.) which lies between the anus and the vulva in the female and between the anus and scrotum in the male. It is a tough sheet of ligaments and muscles.

**Perinthus**, see under HERACLEIA.

**Period and Periodicity**. The word *P.* is often used in a limited sense to denote a definite length of time, e.g. a *P.* of hist. In its wider sense it denotes a continuous cycle of events which continually repeat themselves in a definite order. Thus take 3 events A, B, and C, A always occurring before B, and B before C, and then A, B, C again. The time, say, which elapses between the performance of A and its next performance is called the period of the events, which are termed *periodic*. Thus the succession of days may be termed periodic, the beating of the heart and breathing may also be termed periodic. The revolution of the astronomical bodies is treated as periodic. These illustrations are not *strictly* periodic owing to influences which vary in their action, but for all practical purposes they may be considered so. In electricity the term is applied to the repetition of an alternating voltage; in mechanics to the phases of a vibration or oscillation. The abstract science of mathematics supplies us with strictly periodic events. Thus in trigonometry the sine function goes through a series of values as the angle increases from 0° to 360°, and is then repeated in the same order from 360° to (360 × 2)°, and again to (360 × 3)°, the period in this case being 360°. This idea of periodicity, or the state of being periodic, is of paramount importance in the study of mathematics, simplifying the subject in a remarkable degree. The idea underlies all the theories of wave motion in sound, light, and electricity.

**Periodic Functions**, see FUNCTION.

**Periodic Law**. Newlands (1864) in formulating his 'law of octaves,' pointed out that if the chemical elements are arranged in order of their atomic weights, every eighth element shows strong resemblance. Lothar Meyer stated that 'the properties of the chemical elements are periodic functions of their atomic weights,' being led to this conclusion by a study of atomic volumes and chemical properties of elements. Mendeléeff boldly enunciated the P. L. to cover the observed data. The so-called law has been extremely useful in the correction of inaccurate atomic weights (e.g., beryllium) and as a stimulus towards the discovery of new elements (see GALLIUM). Exceptions to the law were suspected (e.g., tellurium and

iodine); the position of hydrogen was uncertain, etc. Recent work has shown that the law should be: 'The properties of the chemical elements are periodic functions of their atomic numbers' (q.v.). (See CHEMISTRY and ELEMENT.)

**Periodic System**, see CHEMISTRY.

**Periodicals**, see MAGAZINES and NEWSPAPERS.

**Periostitis**, inflammation of the periosteum or fibrous membrane investing the greater part of the surface of the bones. It may be due to injury or infection. In acute infective cases swelling and suppuration occur with considerable constitutional disturbance, and septicaemia may follow. Chronic *P.* may be due to infection from syphilis, tuberculosis, actinomycosis, or may be arthritic in origin. Osteitis (q.v.) and osteomyelitis (q.v.), affecting respectively the bone substance and the bone marrow, are conditions which may be associated with *P.* Any abscess formation must be drained surgically and, fortunately, antibiotic therapy nowadays has assisted considerably in reducing the severity of this disease.

**Peripatetici** (Gk *Peripatētikos*, walking about), name given to an ancient philosophical sect; so designated, it is said, from the circumstance of its founder, Aristotle, being accustomed to deliver his doctrines while walking in the grove of the Lyceum in the suburbs of Athens. Aristotle had a series of successors who taught his doctrines with some modification. The Peripatetic philosophy was introduced into Rome probably by Carneades, and from that time, or at least from the time of Sulla the dictator, it continued to be studied by a few learned men of leisure. See ARISTOTLE.

**Peripatus**, genus of worm-like, many-legged creatures, whose structural features suggest an intermediate character between worms and the higher Arthropods. They are found in Australia, Tasmania, New Zealand, S. America, and Africa, but are absent from Madagascar. They bear a number of short fat legs, and on the head are a pair of antennae and 2 simple eyes. From papillae at the sides of the mouth slime is emitted in jets to catch the prey and also for defensive purposes. See ONYCHOPHORA.

**Periphrasis** (Gk *peri*, around, *phrasein*, to declare), or circumlocution, means saying a thing in a roundabout way, e.g. 'The answer is in the negative,' for 'No.' As a figure of speech it may be used to give impressiveness to a thought, as in the lines:

'The very source and fount of day  
Is flecked with wandering isles of night.'

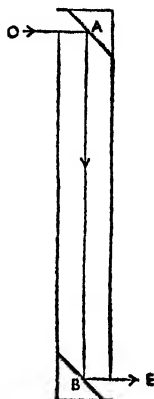
—which is Tennyson's way of saying that there are spots on the sun. It may also be used for euphemism (q.v.), as in Mrs Browning's phrase describing Cowper's madness, 'Discord fell on the music of his soul.' See also FIGURE OF SPEECH.

**Peripteral**, in Gk architecture, a temple surrounded by one row of columns.

**Periscope**, instrument that came into



prominence during the First World War, when it was necessary for submarine and trench observers to see without being seen. The diagram shows a toy P. consisting of 2 plane mirrors, A and B, each mounted at 45° to the axis of the tube in which they are fixed. An aperture enables light from an object to travel along OA to the mirror, where it is reflected to strike the mirror B. The light is reflected from



PRINCIPLE OF THE PERISCOPE

this lower mirror to an observer E, who looks through an aperture in the tube. The mirrors A and B are generally replaced by totally reflecting prisms that perform the same function of reflecting the light as shown in the simple diagram. In addition, there is incorporated a telescopic system of lenses between the prisms that increases the field of view and produces a magnified image of the object. The submarine P. can be rotated about the axis of the tube to enable the observer to see objects in any horizontal direction from the submarine, and usually the line of

sight can be elevated for the observation of aircraft. The firm of Barr & Stroud Ltd. have brought the instrument to a high degree of perfection, in that they have made a P. with a tube of a few in. in diameter give an appreciable field of view with clear vision; they have produced binocular as well as monocular types, also they designed and manufactured the specially small P.s used on the midget submarines which crippled the *Tirpitz* in the Second World War. Submarine P.s may have means of estimating the course, speed, and distance of ships and may act as torpedo-directing telescopes. As they have necessarily a large number of optical parts, the use of anti-reflection films ('blooming') has effected a considerable increase in light transmission. See P. in *Dictionary of Applied Physics*.

**Perissodactyla**, one of the orders of hoofed quadrupeds, characterised by the possession of an odd number of toes on the hind foot, and by the presence of a third trochanter in the femur or thigh bone. There are 3 living families of P.: (1) Equidae or Horses; (2) Tapiridae or Tapirs; and (3) Rhinocerotidae or Rhinoceroses. In addition, there are a number of extinct forms. When horns occur in this sub-order they are always in the middle of the skull. See H. F. Osborn, *The Extinct Rhinoceroses*, 1898, and 'Monograph of the Titanotheres', *U.S. Geological Survey*, 1928.

**Peristalsis**, rhythmical wave-like muscular contractions which occur in certain hollow organs under the control of the involuntary nervous system and propel the contents along, e.g. in the alimentary canal during digestion and in the womb during childbirth.

**Peristyle** (Lat. *peristylum*, Gk *peristulos*, from *peri* about, and *stulos*, a pillar or column), in classic architecture, a range of columns around a building or courtyard; less correctly, a courtyard surrounded by columns.

**Peritoneum**, serous membrane, the largest in the body, forming a double-walled sac completely closed in the male. The visceral layer clothes all the viscera of the abdominal and pelvic cavities, and the parietal layer lines the inner walls of the abdomen, the space between the layers being filled with a film of fluid. The various organs or parts are enclosed in folds or *ligaments* of the P.; the *mesenteries* connect the vertebral column with the intestines; the greater and lesser *omenta* are also folds of P. Blood and lymph vessels are carried in the connective tissue of the membrane, which has a layer of pavement-shaped epithelial cells, between which are numerous openings through which the fluid, indistinguishable from lymph, escapes when in excess into the lymphatics. The great omentum contains some adipose tissue, which, when present in excess, causes abdominal corpulency; the omentum also acts as the 'abdominal policeman' by sealing off and localising infection. The serous fluid may also accumulate in certain diseases (see CIRRHOSIS and LIVER), and this condition is known as ascites (q.v.).

See also under PERITONITIS.

**Peritonitis**, inflammation of the peritoneum (q.v.). It occurs in the acute and chronic form, and may be local or general. The onset is sometimes difficult to distinguish from colic. Commanding with a local pain, it spreads all over the abdomen and becomes intense; the breathing is shallow and rapid, the pulse rapid, the temp. raised, and vomiting is an early symptom. The knees are often drawn up, the abdomen is rigid, and the face pinched, drawn, and anxious; cold sweats, thirst, and diarrhoea are other symptoms after the abdomen becomes swollen, due to fluid. P. is caused by infection of the peritoneum from pyogenic bacteria. The source of the infection is usually an abdominal organ such as an appendix, stomach, or gall bladder. P. is at first localised, but if left untreated it spreads and becomes generalised, leading to pus formation and a severe degree of toxæmia. Common causes of P. are infection from appendicitis and from the perforation of any part of the alimentary canal. Thus a gastric ulcer may perforate and the septic contents of the stomach leak out and infect the peritoneum. Penetrating abdominal injuries are another cause of P. A subacute form of P. is caused by tuberculosis (q.v.). Treatment consists in removing the cause of the infection and giving antibiotics.

**Perityphlitis** (Gk *peri*, around, *tuphlos*, blind), inflammation of the peritoneum (q.v.) or serous membrane, of the appendix and caecum, or blind portion of the large intestine. The term formerly included all those cases of intestinal inflammation now known as appendicitis (q.v.).

**Perivale**, see EALING.

**Periwig**, see WIG.

**Periwinkle**, or **Winkle** (*Littorina*), genus of pectinibranchiate gastropods found on most shores, where they feed on marine vegetation. Some occur at low-water mark, and others on rocks where the sea rarely reaches them. The common P. (*L. littorea*) is a popular article of diet, and some 2000 tons of it are consumed annually in London alone. This species hatches its young from jelly-like eggs laid on seaweed, but *L. rudis*, another Brit. species, retains its young until they have reached a considerable stage of development. The shell of P. is thick, spiral, few-whorled, and top-shaped, with a circular mouth or aperture.

**Periwinkle** (*Vinca*), hardy perennial herbs or sub-shrubs (family Apocynaceae). The large P. (*V. major*) and the lesser P. (*V. minor*) are handsome blue-flowered plants of considerable value for adorning shady positions in gardens where few flowering plants will grow. A number of handsome varieties with variegated leaves and purple or white flowers have been introduced.

**Perjury**, crime of wilfully making a false statement on oath as a witness (or interpreter) in a law court, such statement being material to the question in issue and made deliberately or without belief in its truth. It is for the judge to decide whether the statement was material, and for the jury to say whether the intention of the accused was to deceive. There can be no conviction for P. as a general rule upon the evidence of one witness alone as to the falsity of the accused's statement; there must be either 2 witnesses to contradict the accused, or one to contradict together with some other evidence materially corroborating the contradiction. The whole law of P. was consolidated in the Perjury Act of 1911. Penalties according to gravity of the P. range from fines to 7 years' imprisonment. The term *false swearing* applies to false oaths not taken in the course of judicial proceedings, e.g. false declarations with reference to marriages, births, or deaths, in bankruptcy matters, by a voter, etc. Such false oaths are punishable as P.

**Perkin**, Sir William Henry (1838-1907), chemist, b. London and educ. at the City of London School and the Royal College of Chemistry. He turned his knowledge of chem. to commercial uses. He is best known for his researches in the direction of dyes and coal-tar colourings, and sev. processes were invented by him. He may be said to have founded the coal-tar colour industry. See *Journal of the Chem. Soc.*, 69, 596, (1896), 'Origin of the Coal-Tar Colour Industry'.

**Perkin Warbeck**, see WARBECK, PERKIN.

**Perlis**, state of the Federation of Malaya (q.v.); formerly one of the United Malay States under Brit. protection, it lies on the NW. coast of the Malay Peninsula. Area about 310 sq. m. with a coast-line of 13 m. P. is bordered on the W. by a range of mts running N. and S., which separates it from the Siamese prov. of Setul; on the E. it is bordered by another Siamese prov. and by the state of Kedah; and on the S. by Kedah. Padang Besar on the main trunk line to Bangkok is the frontier railway station between Siam and Malaya. Striking features of the landscape are the isolated limestone hills which rise steeply from the plain. The P. R. is the only one of any size, and is navigable by small craft as far as Kangar, the cap. The present rajah of P. was b. in 1920 and succeeded to the throne in 1945. Rice and tin are the chief products and exports. Until 1821 P. was subject to Kedah, but when in 1841 Siam allowed the Sultan of Kedah to reassume the gov., P. was made an independent state under an Arab rajah. In 1905, at the request of the rajah, a European adviser was appointed to advise him in the finances and general management of the state. By a subsequent treaty, between Britain and Siam, his duties were transferred to a Brit. adviser of the Malayan civil service. By a treaty of 1930 between Britain and P. the latter agreed to continue under the protection of Great Britain as suzerain and to accept a Brit. adviser. Pop. 85,200.

**Perlitic Structure**, structure found in volcanic glasses, such as obsidian. By the contraction (on cooling) of the homogeneous mass, a system of reticulated and spiral cracks has been set up, giving the rock a finely globular character.

**Perm'**, see MOLTOV.

**Permalloy**, see NICKEL.

**Permanent Court of International Justice**, see INTERNATIONAL COURT OF JUSTICE.

**Permanent Debt**, see PUBLIC DEBT.

**Permanganic Acid** (HMnO<sub>4</sub>) is obtained in the form of purple crystals by evaporating its aqueous solution under reduced pressure. The aqueous solution itself is made by the addition of dilute sulphuric acid to barium permanganate and filtering off the precipitated barium sulphate: Ba(MnO<sub>4</sub>)<sub>2</sub> + H<sub>2</sub>SO<sub>4</sub> = 2HMnO<sub>4</sub> + BaSO<sub>4</sub>. P. A. is an unstable, compound readily decomposing to form manganese dioxide, water, and oxygen: 4HMnO<sub>4</sub> = 4MnO<sub>2</sub> + 2H<sub>2</sub>O + 3O<sub>2</sub>. It is very reactive and has powerful oxidising properties.

**Permian**, name given to the lower div. of the New Red Sandstone, which is derived from Perm in Russia, where the strata are well developed. The Brit. P. strata consist of red sandstones, conglomerates, limestones, shales, marls, volcanic and limestone breccias, and beds of gypsum and rock-salt. These strata are in general found connected with the areas of Carboniferous rocks, either fringing the coalfields conformably or resting unconformably on the Millstone Grit or Carboniferous Limestone. On the

E. side of the Pennines the P. rocks occupy a narrow stretch of country from the Tyne through Durham and York to the Trent. The P. on the W. side of the Pennines occurs in the Vale of Eden. In the midlands a coarse breccia rests upon a lower series of corstones and sandstones, and is overlain by sandstones and marls. This breccia is believed to be due to torrential deposition. In Devon and Scotland the rocks are made up of breccias and sandstones, while those of N. Ireland are mainly marls and fossiliferous magnesian limestones. The fossils of the P. are chiefly Palaeozoic in type. The invertebrates include Brachiopods, Lamellibranchs, and Gastropods, which become stunted in the higher beds and finally disappear. The Amphibia, as in the Carboniferous period, belong to the Labyrinthodontia. Fishes such as *Palaeoniscus* also occur, and reptiles appear for the first time in these beds, e.g. *Proterosaurs* and *Parisaurus*. The flora of the P. is closely allied to the Carboniferous. *Pecopteris* and *Odontopteris* ferns of Carboniferous genera are common, as also are lepidodendrons and calamites. Cycads first appear in the P. rocks, and the strata contain characteristic plants such as *Psaronius* and *Walchia*. The P. of India and the S. hemisphere is characterised by *Glossopteris* and other Mesozoic types. In Germany the P. receives the name 'Dyassic', being made up of 2 groups, the Zechstein and Rothliegendes, the former having a bed of rock-salt at Spereberg which is 4000 ft thick. A vast area of P. is found in the Permian in Russia, and near the Urals the beds are of marine type. In Carinthia and Sicily the entire series is marine, containing a rich and peculiar fauna which is also found in the salt ranges of the Punjab. The *Glossopteris* flora of the P. of S. India, S. Africa, and Australia is often so abundant as to afford seams of coal. The existence of boulder beds in these rocks is evidence of glaciation in P. time. In N. America a fresh-water series is found in the Alloghenies and Appalachian and a marine development in Texas. The P. period was one of great earth movement, which brought about the isolation of the coalfields. Continental conditions prevailed over the S. hemisphere, and inland seas were formed over W. Europe from which beds of gypsum and rock-salt were derived. See R. L. Sherlock, *The Permian Triassic Formations*, 1948.

**Permittivity.** When two charges,  $q_1$  and  $q_2$ , are placed a distance  $r$  apart in a medium, the force between them is  $q_1 q_2 / \epsilon r^2$ . The constant  $\epsilon$  is the absolute  $P.$  of the medium, and if  $\epsilon_0$  is its value for a vacuum (or free space), the ratio  $\epsilon / \epsilon_0$  is known as the dielectric constant or relative  $P.$  See DIELECTRIC.

**Permutations and Combinations.** The possible arrangements of  $n$  things taken  $r$  at a time are called *permutations*, and their number is expressed algebraically in the form  $nPr = n(n-1)(n-2) \dots (n-r+1)$ . The special case of the number of possible arrangements of  $n$  things taken  $n$  at a time, i.e. the number of ways in which  $n$

things can be arranged, becomes  $nP_n = n(n-1)(n-2) \dots 3.2.1$ . This expression is called factorial  $n$  and is written  $n!$  or  $n$ .

The possible groups of  $n$  things taken  $r$  at a time, irrespective of the arrangements within the groups, are called *combinations* and are expressed algebraically as  $nCr$ , which is equivalent to  $\frac{nPr}{r!}$ . The relation between  $nCr$  and  $nPr$  is seen from the fact that each group of  $r$  combinations is susceptible to  $r!$  permutation within itself. For simplicity in calculation, when  $r$  is more than half  $n$  it is useful to realise that for each group of  $r$  things selected from among  $n$  things there is a corresponding group of  $(n-r)$  things, so that  $nCr = nC_{n-r}$ . Proof,

$$nCr = \frac{nPr}{r!} = \frac{nPr \cdot (n-r)!}{r!(n-r)!} = \frac{n!}{r!(n-r)!}$$

$$nC_{n-r} = \frac{nP_{n-r}}{(n-r)!} = \frac{nP_{n-r} \cdot r!}{(n-r)!r!} = \frac{n!}{r!(n-r)!}$$

**Pernambuco**, state of NE. Brazil, on the Atlantic coast. The coast regions are low-lying, while the inland areas rise in a plateau. The former, known as Matos, are the forest regions. The chief products of the state are sugar, fruit, tobacco, cotton, coffee, all of which, with rum and rubber, are exported. The average yield of sugar from the P. cane is 65 tons per hectare, or 2½ ac. Maize, manioc or cassava, and other foods are cultivated for local consumption by the labouring classes. The chief port and cap. is Recife (q.v.), this name being used for the whole port, including São Antônio and Boa Vista. Area 37,458 sq. m. Pop. 3,395,185. P. wood is a variety of Brazil wood, which as a dye wood is exported in large quantities. This variety is the product of *Caesalpinia echinata*. The Sp.-Brazilian trade with the wealthy sugar prov. of P. was at its height in the first quarter of the 17th cent., when the Sp. and Portuguese crowns were united, and before the renewal of the Dutch war drove Sp. shipping from the S. Atlantic.

**Pernettya**, a genus of small evergreen shrubs, family Ericaceae, native to S. America; *P. mucronata* and varieties are esteemed for their profuse pink berries in autumn gardens.

**Pernau**, see PÄRNU.

**Pernov**, see PÄRNU.

**Perón, Juan Domingo** (1895- ), Argentine politician and dictator, b. near Lobos, a tn S. of Buenos Aires (q.v.). Educ. at military schools, he became a lieutenant at 20, and had further training in Germany. Between then and 1943 he was little heard of outside his own country; but on 4 June of that year he led a party of young Nationalist military officers in a successful coup d'état against President Ramón Castillo. From that time he was the power behind the president, although for a time he held no conspicuous office. In 1944, however, President Farrell appointed him to be war minister and then vice-president. In Feb. 1946 he was elected president on the Labour party platform and inaugurated in the following

June. With the help of his wife, Eva (d. 1952), P. had soon estab. himself as a demagogic, nationalist dictator. The press was rigidly controlled, the constitution subverted, and foreign business interests attacked. The living standard of the poorer people was raised by P., but the economic basis of his policy was unsound, and resulted in inflation and discontent. After the death of his wife, P.'s policy veered to an attack on the Catholic Church, and in the result discontented clericals and radicals combined with influential elements in the armed forces to bring about his fall. A characteristically worded attack on the opponents of his regime was made by P. at Santa Fé in Sept. 1948, with prin. reference to the opposition of the Radical party to proposals for the reform of the constitution which had been passed by the 'Peronista' majority in Aug. 1948. He identified his opponents as 'all who are rich, those who do not work, those who are professional politicians, and those who defend the interests of foreign capitalistic trusts,' adding that though for the past 2 years he had called for 'peace and co-operation' he would 'speak with a firm voice on the day I order them' (his opponents) 'to be hanged.' P. was overthrown by a revolution in 1955 (see ARGENTINA, *History*), and he at present (1957) lives in exile in another part of S. America. He still enjoys considerable influence in Argentina, however. See Fleur Cowles, *Blood Precedent*, 1952; G. I. Blanksten, *Peron's Argentina*, 1953; T. Owen, *Peron: His Rise and Fall*, 1957.

Péronne, Fr. tn in the dept of Somme, 22 m. SSW. of Cambrai. It was the scene of the signing of a treaty forced by Charles the Bold of Burgundy on Louis XI in 1468, and was captured by Wellington in 1815 and by the Germans in 1871. In the First World War it was twice in Ger. hands, and was almost completely destroyed; it was afterwards rebuilt. There is a woollen industry. Pop. 4000.

Perosi, Lorenzo (1872-1956), It. priest and composer, b. Tortona. He studied music at the Conservatory of Milan. He became choirmaster at St Mark's, Venice, in 1894, and afterwards director of the Sistine Chapel in Rome in 1898. In 1905 he was nominated perpetual master of the Pontifical Chapel. Most of his music is sacred, his fame resting principally on his masses and oratorios. See studies by A. Damerini, 1924; A. Pagliarunga, 1952, and M. Gliński, 1953; also Z. Musznel, *Don Lorenzo Perosi e le sue opere*, 1932.

Pérotin, Perotinus Magnus (12th cent.), Fr. music scholar, see FRENCH MUSIC.

Pérouse, La, Jean François de Galaup, Comte de (1741-88), Fr. navigator, b. near Albi. He served with distinction during the war with England (1778-83), especially on the E. coast of Canada and in Hudson Bay, where he captured Forts Prince of Wales and York (1782). In 1785 he set out from Brest to discover the NW. passage and also to explore the NW. coasts of America and the NE. coasts of Asia, as well as the China and

Japan seas, the Solomon Is., and Australia. He reached Mt St Elias in Alaska and visited the Hawaiian Is., discovered Necker Is., and then crossed over to Asia, where after exploring the coasts of Japan, Korea, and Chinese Tartary, he discovered La P. Strait between Saghalien and Yezo. In 1788 he sailed from Botany Bay, after which all trace of him was lost until 1828, when wrecks were discovered N. of the New Hebrides by Dumont d'Urville. They were brought back to France, and are in the marine museum of the Louvre. See M. Mureau, *Voyage de la Pérouse autour du monde* (4 vols.), 1797.

Pérouse Island, La, see LORD HOWE ISLAND.

Perovo, tn in the Moscow Oblast of central Russia, an industrial suburb 6 m. SE. of Moscow. It has engineering and chemical industries and sov. research institutions, mainly in agriculture. In the 1930's it absorbed Kuskovo (q.v.). Pop. with Kuskovo (1956) 132,000 (1926, 24,000; 1939, 78,000).

Perowens, John James Stewart (1823-1904), divine and scholar, b. Burdwan, Bengal. Bishop of Worcester from 1891 to 1901. He was a biblical scholar and exegetist and wrote a work on the Book of Psalms. He lectured on theology at Trinity College, Cambridge, and ed. the *Cambridge Bible for Schools*. He was made canon of Llandaff in 1869, and dean of Peterborough in 1878. Other works of his were *The Labours and Strength of the Christian Ministry*, 1857; *Immortality*, 1869; and *The Doctrine of the Lord's Supper*, 2nd ed., 1887. He also ed. the *Letters and Remains of Bishop Thirlwall*, 1877.

Perpendicular Architecture, see ENGLISH ARCHITECTURE.

Perpetual Cure, see CURATE.

Perpetual Motion has been sought by many earnest experimenters in the past, in spite of its scientific impossibility. A P. M. machine would be one that moved and continued to move for ever without receiving any supply of energy from an external source. The requirements of such a machine are either that it shall be perfectly frictionless, or if friction is present, that the machine shall create energy in order to overcome the friction. The first requirement, complete absence of friction in a real machine, is impossible, and the second violates the law of conservation of energy, which states that the total energy of an isolated system is constant; it can neither be increased nor decreased. In other words, energy can neither be created nor destroyed (see, however, ENERGY). The only hope of discovery of P. M. lies in the discovery of an exception to the law of conservation of energy, and although no scientific law is dogmatic, this law is based on the reliable and patient experiments of generations of scientists. The interconvertibility of mass and energy in no way invalidates the arguments against the possibility of P. M. The required 'creation' of energy would be at the expense of the mass of the machine, which could not therefore

continue for ever. Many examples of attempts to produce P. M. are given in E. da C. Andrade's book, *Engines*, 1928.

**Perpetuity.** Eng. law regards as null and void any tying-up of property, real or personal, beyond the period of a life or lives in being and 21 years (together with a further period for gestation, where, in the particular case, it actually exists) afterwards. In other words, any marriage settlement, will, or other instrument providing for the future destination of property must ensure that the property shall in any conceivable event ultimately vest in possession within the above-stated period: e.g. a gift by will in trust for X for life, and after his death to such of his children as shall reach 21 years of age to vest in them respectively at that age, is valid; but to A for life, and after his decease to such of his children and grandchildren as shall reach 21, is void as a P.; for though any children of A must, if they reach 21, necessarily do so within 21 years of A's death, some of the grandchildren might not. Any limitation void as a P. fails altogether, and hence, in the above example, the whole devise to the class made up of both children and grandchildren would fail. See also LIMITATION OF ESTATES; LAND LAWS.

**Perpignan**, Fr tn, cap. of the dept of Pyrénées-Orientales, on the Têt. It was the anct cap. of Roussillon (q.v.), estab. on the site of the Rom. Ruscino, where the E. route to Spain crosses the Têt. It is the seat of a bishopric. There is a vast citadel, partly by Vauban (q.v.) enclosing the castle of the Kings of Majorca. The fine Gothic cathedral was begun in 1324, and there are many other anct buildings. P. is an important commercial centre for wine, fruit and vegetables, and manufs. textiles and paper. Pop. 70,050.

**Perranzabuloe**, par. of Cornwall, England, 5½ m. NW. of Truro. Here is 'St Piran's Oratory,' built in the 5th cent., discovered in 1835 after being buried in sand for centuries, and now enclosed in a concrete shell for preservation. About 1150 a second church was built here, but was also enveloped, and the present par. church was erected (1804) more than 2 m. inland, largely from parts removed from the second church. Perranporth, the prin. centre of pop. in the par., is noted for its 3-m. stretch of sandy beach. Pop. 3300.

**Perrault, Charles** (1628-1703), Fr. writer, b. Paris. In 1651 he became a member of the Paris Bar, and under Colbert was appointed controller-general of the royal buildings. In 1671 the influence of Colbert procured for him an entrance into the Fr. Academy, where he introduced sev. important reforms. His name was first made well known by his famous controversy with Boileau regarding the comparative merits of the ancients and moderns. P. contributed to the quarrel in a poem entitled *Le Siècle de Louis le Grand*, which, read before his confrères of the Academy in 1687, was intended to prove that modern authors were superior to the ancients. It was

followed by *Parallèles des anciens et des modernes* (4 vols. 1688-97), and *Hommes illustres du siècle de Louis XIV* (1696), containing 200 critical biographies. But the work that has far more than any other preserved his name is his fairy tales collected as *Contes de ma mère l'Oye*, 1697. The individual titles are *La Belle au Bois Dormant*, *Petit Chaperon Rouge*, *La Barbe Bleue*, *Le Chat Botté*, *Les Fées*, *Cendrillon*, *Riquet à la Houppe*. P. has no claim to the invention of the subject; but his skill in adjusting style to matter could not easily be rivalled, much less exceeded.

See P. Saintyves, *Les Contes de Perrault*, 1923.

**Perrault, Claude** (1613-88), Fr. architect, b. Paris, brother to Charles. He was by profession a physician, but abandoning this became the architect of the Louvre, his colonnade (1664) ranking among the finest buildings of the 17th cent. He also designed the Observatory at Paris, c. 1667, trans. Vitruvius's *De Architectura*, 1673, and helped his brother in the writing of his *Mémoires*. See A. Hallays, *Les Perrault* (2nd ed.), 1926.

**Perret, Auguste** (1874-1954), Fr. architect, b. Brussels. He was a pioneer of reinforced-concrete construction. After studying at the Ecole des Beaux Arts, Paris, he began practice c. 1897 with his brother Gustav, b. 1876. Their chief works were the Casino at St Malo; the Champs Elysées Theatre, Paris; remarkable churches at Raincy (1922) and Montmagny (1925) near Paris; the Museum of Public Works and the National School of Music, both in Paris; and Marignane Airport, 1947. P. was awarded the R.I.B.A. Royal Gold Medal, 1948.

**Perrin, Claude Victor**, see VICTOR.

**Perrin, Jean Baptiste** (1870-1942), Fr. physicist, b. Lille, noted for his studies of the structure of matter and the equilibrium of sedimentation. In 1924 he received the Nobel prize for his work on these subjects. His works include *Traité de chimie physique* (vol. 1.), 1903; *Les Atomes*, 1913; and *Les Elements de la physique*, 1930.

**Perron**, in architecture, a platform outside the entrance-door of a building, with steps leading up to it, often in a double flight.

**Perry, Matthew Calbraith** (1794-1858), Amer. naval officer, b. Newport, Rhode Is., U.S.A. As commander of the *Fulton*, the earliest steam warship (1837), he is sometimes called the 'father of the steam navy' of America. In 1843 he commanded the African Squadron organised to put down the slave trade, and in 1846-7 he served in the Mexican war, in which his squadron seized Frontera, Tabasco, and Laguna. But his chief title to fame is that he led an expedition in 1853 to Japan and negotiated a treaty which in effect reopened communication between that country and the rest of the world after 250 years of isolation. This treaty between Japan and America, which was signed on 31 Mar. 1854, granted America trading rights at Hakodate and Shimoda. It was ratified at Shimoda on 21 Feb.

1855. His report, pub. by the gov. in 1856, was entitled *Narrative of the Expedition of an American Squadron to the China Seas and Japan*.

Perry, Oliver Hazard (1785-1819), Amer. naval captain, who held various commands during the war of 1812. He had charge of the Lake Erie squadron, and defeated Capt. Robert Barclay, who had served with Nelson, at the battle of Lake Erie. P. took an important part in the operations of Detroit, and at the battle of the Thames. He was honoured by the thanks of Congress. He commanded the *Java*, 44 guns, in 1816-17, and cruised in the Mediterranean. In 1819, while in command of a small fleet on a mission to Venezuela, he d. of yellow fever.

Perry, alcoholic liquor which is manufactured from certain varieties of pears as cider is from apples. It is sweet and of a pale colour, and contains from about 3 to 8 per cent of alcohol. It is made chiefly in England in the cos. of Gloucester, Hereford, Worcester, Somerset, and Devon.

Perryville, vil. in Boyle co., Kentucky, U.S.A., the scene of Gen. Braxton Bragg's unsuccessful campaign against Union forces under Gen. D. C. Buell. Near by is P. Battlefield State Park.

Perse School, Cambridge, was founded in 1615 under the will of Stephen P., fellow of Gonville and Caius College. It is now a direct grant school governed under a scheme of 1910 (amended 1918 and 1921). A girls' school was estab. in 1881.

Persea Gratissima, see AVOCADO PEAR.

Persecution, attempt to suppress obnoxious opinions, chiefly in the field of religion, by temporal punishment, sometimes including the death penalty. The early Christians underwent much P. from the Jews, and the Rom. Gov. The number of P.s suffered under the Rom. emperors is usually somewhat artificially reckoned as 10: under Nero, AD 64; Domitian, 95; Trajan, 107; Hadrian, 135; Marcus Aurelius, 165; Septimius Severus, 202; Maximinus, 235; Decius, 249; Valerianus, 257; Diocletian, 303. Others omit Hadrian and insert Aurelian, 275. When Christianity became the state religion there was much P. of the Catholics by the Arians, and by the Catholics of the various heretical sects. In the Middle Ages P. was freely used as a weapon against the spread of heretical and subversive opinions, as in the case of the Cathari and Albigenses. The Protestant reformers used the same methods. The cases of Servetus at Geneva, and of the Quakers in New England, are classic examples. The Jews (q.v.) have suffered severe P.s throughout Europe at different times, millions being massacred under Hitler's regime. The most terrible P.s carried out in this cent. have, however, been conducted by Communist regimes against their political opponents, against deviationists from the strict party line, and against those who, however faithful, have fallen into disfavour for any reason, and who become convenient scapegoats.

Perseid Meteors, popularly designated as 'sparks from St Lawrence's gridiron,' are a swarm of meteors moving round the sun in a retrograde and elongated orbit. This orbit is intersected by that of the earth about 10 Aug. each year, with the result that a shower of 'shooting-stars' comes from a *radiant* in the constellation Perseus. An intermittent display of Perseids continues for about 3 weeks before and after that date, showing that the swarm must be about 30,000,000 m. in width. It was shown in 1866 by the It. astronomer, Schiaparelli, that the orbit of the P. M. is probably identical with that of Tuttle's comet (1862) and that the meteors are the cometary debris striking the earth's atmosphere. See METEOR.

Persephone, see PROSERPINA.

Persepolis, anct city of Persia, 40 m. NE. of Shiraz, now in ruins, became the cap. of the Persian Empire under Darius I. Considerable ruins remain from Darius, Xerxes, and Artaxerxes. Alexander, on his march through Persia, spent 4 months in P. Towards the end of his stay the city was burnt; Alexander, as the story goes, setting fire to the palace with his own hand at the end of a revel, at the instigation of the courtesan Thais, 331 BC. Some, however, suppose that the burning of the city may have been deliberately ordered. See also PERSIA, *Antiquities*, PERSIAN ART. See E. F. Schmidt, *The Treasury of Persepolis*, 1939.

Perseus, son of Zeus and Danaë (q.v.), the daughter of Acrisius, King of Argos. Polydectes, King of Seriphos, in love with Danaë, sent P. on the quest for the head of Medusa the Gorgon (q.v.). He got this with the help of Athena and Hermes. On his way home P. rescued Andromeda from a sea-monster and married her. Returned to Seriphos, he found that his mother had taken refuge in a temple to escape the attentions of Polydectes, whom he promptly turned to stone with the Gorgon's head. He then took his wife and mother to Argos, whence he travelled to Larissa and accidentally killed Acrisius (q.v.) with a discus. Thus was fulfilled the prophecy made before his birth. P. was successively King of Argos and Tiryns; the foundation of Mycenae (q.v.) is attributed to him. See E. S. Hartland, *The Legend of Perseus*, 1894-6; and J. M. Woodward, *Perseus: a Study in Greek Art and Legend*, 1937.

Perseus, anct N. constellation (between Taurus and Cassiopeia) rich in astronomical interest; see also NOVAE, and PERSEID METEORS. In the head of Medusa (in the W. of P.) is the well-known short period variable Algol or  $\beta$  Perseus (q.v.).

Perseverance of Saints, doctrine necessarily resulting from the predestinarian doctrines of Luther and Calvin (q.v.). It is supported by other doctrines too, those of election, the atonement, intercession, and mediatorial dominion of Christ, imputed righteousness and regeneration; and also by quotations from Scripture, which declare eternal life to be

always connected with believing, and encourage the believer to depend on the faithfulness, love, and omnipotence of God. To the objection that it might tend to make men careless concerning virtue and holiness, its advocates reply that P. of S. is perseverance in holiness, giving no encouragement to a confidence in final salvation which is not connected with a present and even an increasing holiness.



PERSEUS HOLDING THE HEAD OF  
MEDUSA

Statue by Benvenuto Cellini.

**Pershing, John Joseph** (1860-1948). Amer. soldier, b. Laclede, Missouri; the commander-in-chief of Amer. Forces in France in the First World War. He was the son of a foreman platelayer on the railway. On leaving school at Kirksville he worked in a general store, and after successfully competing in an examination for cadetships to the U.S. Military Academy he was posted to the 6th U.S. Cavalry. He was then assigned as military instructor at the univ. of Nebraska, and, later, as teacher of tactics at the U.S. Military Academy. Having served in Cuba and the Philippines, he was promoted brig.-gen. in 1906 and major-gen. in 1913; when the U.S.A. broke off diplomatic relations with Germany early in 1917, P. was given command of the Amer. forces. He found himself in disagreement with the allied commanders as to the distribution of his troops. But so grave had the military situation become during the great Ger. offensive on the Somme and Lys in Mar.-April 1918 that he was compelled for a time to place his

troops unreservedly at Foch's disposition. P. conducted 2 major operations. In Sept. 1918 in one battle he 'flattened' the famous salient at St. Mihiel (q.v.) which the Germans had held throughout the war. He then wished to advance on Metz, but was overruled by Foch and assigned the difficult terrain of the Meuse-Argonne, where the battle raged through the autumn months until, on 7 Nov. 1918, Amer. troops were in sight of Sedan. On 1 Sept. 1919 the administration showed its appreciation of his services by making him a full gen. of the Amer. Army, a rank which had only been held by 4 men before, Washington, Grant, Sherman, and Sheridan. In 1921 he became chief of staff of the army, and retired in 1924. P.'s greatest quality was resolution; as a strategist he had little subtlety, nor did he at first appreciate the resilience of the Ger. defensive system. His organising ability was great, and his confidence unshakable. His own story has been told in his book, *My Experiences in the World War*, 1931.

**Pershore**, mkt tn in the co. of Worcester, and 9 m. SE. of the city of that name, on the Avon. It contains 2 churches, that of St Andrew's, small and anct, and the church of the Holy Cross, in Norman and Early Eng., with a lofty square tower. This church is the only remaining portion of the anct abbey-church of the same name. The inhab. are chiefly employed in manufacturing agric. implements, and in raising fruits and vegetables for the markets of the large manufacturing tns in the vicinity. Pop. 4500.

**Persia** (Iran), kingdom of W. Asia, comprises 628,000 sq. m., and extends some 1400 m. from NW. to SE. and some 875 m. from N. to S. It is bounded in the W. by Turkey and Iraq, in the SW. and S. by the Persian Gulf and the Gulf of Oman, in the E. by Baluchistan, Afghanistan, and the U.S.S.R., and in the N. by the U.S.S.R. and the Caspian Sea. The name changed from Persia to Iran in 1935, reverted to Persia in 1942, and is now again Iran. P. consists mainly of a tableland ringed by high mts, with narrow lowland strips bordering the Caspian Sea and the Persian Gulf, the former varying from 10 to 70 m. in width. The Zagros Mts extend in an arc from Armenia to Baluchistan in a series of parallel ranges trending from NW. to SE. In the NW., which is stony, undulating country with the main centres of pop. in the larger riverine tracts, are a number of downthrow basins, including that of Lake Reza'iyeh, which covers 20,000 sq. m., and numerous volcanic cones, such as Mt Savalan (14,000 ft). From the mts of Kurdistan, the Diyala and Karkheh rive. flow into the Tigris. In the central part of the Zagros, extending to Bandar Abbas, the dominant feature is folding, not faulting as in the NW., and the drainage follows a complicated pattern; sev. peaks rise to over 13,000 ft, notably in the Bakhtiari country. The valleys are mostly covered with vegetation, and in parts are wooded; cultivation is possible

where water is available; the bulk of the pop. of this region is, however, pastoral. To the SW. of the central Zagros lies a flat alluvial plain watered by the Karun R., which is joined below Shushtar by the Ab-e Dez. The Karun, which enters the Shatt ul-Arab at Khorramshahr, is navigable to Ahvaz by ocean-going steamers. The SE. part of the Zagros consists of a plateau of an average elevation of 6000-7000 ft rising from a narrow coastal plain; from Bandar Abbas to Jask the direction of folding is from N. to S. At the E. end of the Zagros is the Jaz Murian basin, the lowest part of which has an elevation of

Sanandaj. The Gorgan R., rising in Khorasan, enters the E. end of the Caspian Sea after a course of some 200 m. On the E. side of the central plateau, between the Kopet Dag and the Zagros, lies an irregular highland region of barren jagged peaks, drifting sand, and great extremes of climate, and to the S. of it the basin of the Helmand R., which formerly grew much grain. The central plateau contains a number of closed basins, the lowest parts of which have an elevation of 2000-3000 ft, except in the SE., where they fall to 1000 ft. The Dasht-e Kavir and the Dasht-e Lut



A ROAD IN KHORASAN PROVINCE

E.N.A.

1000 ft. The Jaz Murian is divided from the central plateau by a ridge of high land with an average height of 4000 ft with Mt Baznan (11,000 ft) and Mt Taftan (12,000 ft), a dormant volcano, in the E. The SE. Zagros is a desolate country of bare rocks and sand-dunes, with cultivation, mainly date groves, only where water is available. The N. highlands run between the Caucasus and the Hindu Kush, and consist of the Elburz and the Kopet Dag. The Elburz rise in a series of steep narrow folds from the S. borders of the Caspian Sea, which is 88 ft below sea-level; the highest peak, the volcanic cone of Mt Damavand, rises to over 18,000 ft. The N. slopes of the Elburz are well-wooded up to 7000-8000 ft with deciduous forests; close to the Caspian shore is a zone of sand dunes and lagoons. The Kopet Dag to the E. of the Elburz joins the Parapamisan range in Afghanistan. The Saffrud R. enters the Caspian Sea E. of Rasht after a tortuous course of nearly 600 m. from near

deserts stretch across the central, E., and SE. part of the plateau. The fauna of P. is predominantly Palaearctic, except in Baluchistan and on the shores of the Persian Gulf, where Indian and Indo-African forms are found. On the plateau the fauna includes wild boar, foxes, jackals, badgers, hares, leopards, wolves, ibex, moufflon, bears, wild asses, frogs, toads, tortoises, lizards, some snakes, and game birds of great variety. The climate is one of extremes, great variations in rainfall, and high winds, especially in the SE. Summer temps. are high, with, on the plateau, a rapid fall of temp. at night; the winters are cold. The mean day maximum in July at Tehran is 99° F., Mashhad 92° F., and Kerman 101° F.; in Sistan the temp. may rise to over 120° F. and in the region of the Persian Gulf over 125° F. has been recorded. The average Jan. temp. on the plateau is 35° F. in the N. and NW. and 45° F. in the S. and E. In the NW. temps. below 0° F. are not unusual. Heaviest



rainfall is in the NW. Zagros and on the N. side of the Elburz. In the W. the Caspian littoral has an ann. average rainfall of 50-60 in., but only 20 in. in the E. The Kopet Dag and the SE. Zagros have under 10 in. On the plateau rainfall varies between 9 in. in Tehran, approximately 5 in. in Isfahan and Kerman, 7-8 in. in Khorasan, and 2½ in. in Sistan. In the N. (the Caspian provs. excepted) the maximum rainfall is in Mar., but in the S. in Dec. to Jan. Heavy snowfalls are common on the plateau in winter. The air is dry on the plateau, but on the Caspian and the Persian Gulf humidity is high, having a winter maximum in the former region and a summer maximum in the latter. The prevailing winds are NW. and SE. The main crops grown on the plateau are wheat, barley, millet, maize, lucerne, pulses, cotton, tobacco, opium, sugar beet, vegetables, fruit of different kinds, and vines; various gums are also cropped. Rice is grown in Gilan and in small quantities elsewhere where abundant irrigation water is available, notably Lenjan (near Isfahan), Mianduh, and parts of Khuzistan; dates are grown in S. P. Silk is produced mainly in the Caspian provs. Irrigated farming is the dominant type of cultivation, and, except in the Caspian littoral, water is the limiting factor, whether irrigated or dry farming is practised. Irrigation is by rivs., underground channels (*qanat*), and wells. Dry farming is practised on the Caspian littoral for crops other than rice, in considerable areas of Azerbaijan, and to a lesser extent in Khorasan, Kurdistan, and Pers. Stock-raising is important, especially among the semi-nomadic tribes.

**POPULATION.** The census taken in 1956 put the total pop. at 18,944,821. It is irregularly distributed, being concentrated mainly in the large riverine tracts, riv. and mt. valleys, and on the inside slopes of the Zagros and Elburz. The density over the country as a whole is under 25 to the sq. m. The main tns are Tehran, the cap., with a pop. which has grown rapidly in recent years to 1,513,200, Tabriz (290,000), Isfahan (254,900), Mashhad (242,200), Abadan (226,100), Shiraz (189,100), Kermanshah (125,200), Ahvaz (119,800), Rasht (109,500), Hamadan (100,000), Qum (95,500), Reza'iyeh (67,600), Yazd (66,500), and Qazvin (66,400).

**Oil.** The Khuzistan oil deposits lie on the W. flank of the Zagros. Oil occurs in dome-like anticlines, which are among the largest oil structures in the world. The first of the 6 fields in this area to come into production was the Masjid-i Sulaiman field, where oil was found in 1908; commercial production started in 1912 and was increased after 1918. The Haft Kel field was developed in 1928, and other fields during or after the Second World War. A pipeline goes from Masjid-i Sulaiman to the oil refinery in Abadan, which by the end of the Second World War had an ann. capacity of 25,000,000 tons. A smaller field has been developed at Naft-i Shah, which lies close to Naft Khanah on the Iraqi side of the frontier,

and from it oil is taken by pipeline to a refinery at Kermanshah. The oil deposits of S. P. were formerly exploited by the Anglo-Persian (later Anglo-Iranian) Oil Company, which took over in 1909 the concession granted to W. K. D'Arcy in 1901 by Muzaffar ud-Din Shah. The Brit. Gov. acquired a controlling interest in 1914. The concession was granted for 60 years; its area originally covered all P. except the 5 N. provs.; 16 per cent of the net profit was to be paid in royalties to the Persian Gov. After the world slump of 1929-30, the price of oil fell and profits declined. In 1932 Reza Shah denounced the concession. The matter was referred to the League of Nations, but eventually settled by negotiation between the company and the Persian Gov. Adjustments were made in royalty payments, the concession area was reduced from 480,000 sq. m. to 100,000 sq. m. in SW. P., and the concession was renewed till 1993. During the Second World War special arrangements with regard to royalty payments were made to prevent them falling below a certain figure; in 1948 negotiations were opened with the A.I.O.C. for a revision of the royalty terms. The negotiations failed, and in April 1951 the oil industry was nationalised and the A.I.O.C. expropriated. Production ceased pending a settlement of the dispute. Negotiations for the settlement of the oil dispute were eventually reopened, and an agreement was signed in Sept. 1954 between the Persian Gov., the National Iranian Oil Company, and an international consortium formed by the Gulf Oil Corporation, Socony Vacuum Oil Company Inc., Standard Oil Company (New Jersey), Standard Oil Company of California, and the Texas Company (each 8 per cent), Royal Dutch Shell (14 per cent), Compagnie Française des Pétroles (6 per cent), and Brit. Petroleum (40 per cent). In the first 11 months of the new agreement P. received over £26m. from the operation of its oil industry in Khuzistan. Payments for 1956 were £54.3 million. The production of crude oil rose in the following year to 34,800,000 tons. In 1957 an agreement was signed between the N.I.O.C. and an It. company for the exploration and development of oil in Makran and the Zagros mts and off-shore oil in the Persian Gulf. Agreements were signed in 1958 with various Amer. companies and the Canadian Sapphire Co.

**MINERALS.** Other than oil, deposits include gold, silver, lead, copper, antimony, nickel, cobalt, zinc, manganese, borax, ochre, potash, iron, and coal. Copper is worked at Anarak, near Yazd. The main coal mines are at Shemshak and Zirab. Red oxide is produced at Hormuz Is. Salt pits are numerous. P. was formerly noted for its turquoise and other precious stones, the former being worked at Nishapur. All sub-soil rights belong to the State.

**INDUSTRY.** After oil the main industry is the textile industry. Locally grown cotton is supplied by the State to the mills, the main concentration of which is at

Isfahan; Shahi, where the mills are state-owned, Tabriz, Yazd, Shiraz, Kerman, and a few other towns also have mills. There is a state-owned silk factory at Chalus. Fabrics of many kinds are also made as home industries. The manufacture of carpets is largely carried on as a home industry. The State runs a number of sugar-beet factories, a fruit- and meat-canning factory at Shahi, plants for cleaning rice and tea, and, in Tehran, a tobacco factory, cement factory, soap factory, a copper refinery, and various other industrial undertakings. There

to Kermanshah was constructed by the Brit. Expeditionary Force in Iraq, and in S. P. the Brit. forces constructed a motor road from Borazjan to Shiraz. Under Reza Shah road building was energetically prosecuted. The road system was further improved during the Second World War, and there are some 17,000 m. of roads of various types. After the war the road system fell into disrepair, but is now being repaired and extended under the supervision of the Ministry of Roads and the Seven-Year Plan organisation. Motor-bus services connect the large towns.



*Imperial Embassy of Iran*  
THE ALBURZ OIL WELL IN QUM

is a glass factory in Tehran, and a number of match factories and soap factories in different parts of the country. The main centres of the tanning industry are Hamadan, Tabriz, and Tehran. There is a steel works at Karaj. The Caspian fisheries, formerly exploited by a Russo-Persian firm under a concession which expired in 1953, are run by the State, which also owns a fish-canning factory in Bandar Abbas.

**COMMUNICATIONS.** Trade routes between E. and W. have since early times passed through P.; during the 18th and 19th cents. the roads decayed. A road from Rasht to Tehran via Qazvin was constructed by a Russian company under a concession granted in 1893. A Brit. company improved the old mule track from Isfahan to Ahvaz (the Lynch Road) under a concession obtained in 1897. In 1918 a metalled road from Khanagün

Motor transport has largely replaced pack animals. The Trans-Iranian Railway (total length 865 m.) from Bandar Shah, on the Caspian Sea, to Bandar Shapur, on the Persian Gulf, was officially inaugurated in 1938. The line runs via Tehran, Qum, Arak, and Ahvaz; branch lines to Tabriz, Mashhad, and Kerman are under construction. A railway line runs from Tabriz to Julfa and from Zahedan to Mirjawa. The main ports are Bandar Shah and Pahlavi on the Caspian Sea, and Khorramshahr, Bandar Shapur, Bushire, and Bandar Abbas on the Persian Gulf. Aerial transport was instituted in 1926, and run till 1932 by the Ger. Junkers firm. Iranian Airways now operates services between the prin. tns. Air France, K.L.M., and various other companies run services to Tehran. Telegraphic communication in P. began about 1860, and the lines operated by the

(Brit.) Indo-European Telegraph Company were an important link in communications between Europe and India; the company withdrew almost completely from P. in 1931. The telegraph system, run by the State, now covers about 11,300 m.: telephones are controlled by sev. small companies, but principally by the Société Anonyme de Téléphones Perso. There are also stations for wireless telegraphy. The Tehran broadcasting station was opened in 1940, the first of a network to be distributed over the whole country. Postal services are operated by the State throughout the country.

GOVERNMENT. Constitutional parl. gov. was set up in P. under the royal proclamation issued by Muzaffar ud-Din Shah on 5 Aug. 1906. This and the Fundamental Laws of Dec. 1906 and the Supplementary Fundamental Laws of 7 Oct. 1907 are the basic documents of the Persian Constitution. The legislative power is vested in the National Consultative Assembly, which is elected by universal male suffrage for a period of 4 years and numbers 136 members. The country is divided into constituencies, some of which are plural; Jews, Zoroastrians, and Armenians have special representation. The internal grouping of the National Consultative Assembly is not based on political parties. The National Consultative Assembly alone has power to impose, reduce, or abolish taxes, make appropriations, approve loans, and grant concessions. Its other rights include the initiation of legislation, direct representation to the Shah, and, in certain circumstances, the demanding of the dismissal of a minister or ministers. Treaties and covenants are subject to the approval of the National Consultative Assembly, with the exception of treaties which for reasons of state and the public advantage must be kept secret. Provision was made in the Fundamental Laws for a Senate, but this was not convened until 1950. It consists of 30 elected members and 30 members nominated by the Shah. Its members hold office for 6 years. Bills, except financial bills, are referred from the National Consultative Assembly to the Senate for approval. Measures after approval by both chambers receive the royal assent and then have the force of law. The constitution was amended in 1949 to give the Shah power to dissolve one or both chambers, subject to his stating his reason and simultaneously ordering new elections so that the new chamber or chambers could convene within 3 months. Dissolution may not be ordered twice for the same reason. The executive power appertains to the Shah, who is, however, exempted from responsibility, all laws and ordinances being carried out in his name by ministers and state officials. Gov. is by cabinet, which is outside, but responsible to, the legislature. The appointment and dismissal of ministers are effected by royal decree, the Prime Minister being appointed on the recommendation of the National Consultative Assembly. The cabinet includes ministers of the interior, finance,

war, justice, foreign affairs, agriculture, health, education, commerce, labour, national economy, posts and telegraphs, and roads, and may include also ministers without portfolio. The minister of court is not a member of the cabinet. Laws, drafted in the ministries concerned, are laid by the responsible minister before the National Consultative Assembly for acceptance or rejection. Administratively the country is divided into 11 provinces (*ostans*), each under a governor-general, and 3 independent governorates. These are subdivided into *shahrestans*, centred upon some important town with a governor in each, and further subdivided into *bakhsh's* and *dehestans*. The majority of towns under the law of 1930 have elected municipal councils and levy municipal taxes.

Muhammad Reza Pahlavi, the present Shah, married in 1939, when crown prince, the sister of Farouq (then king of Egypt), Fawzieh, by whom he has one daughter. He divorced Queen Fawzieh in 1948, and in 1951 married Queen Soraya whom he divorced in 1958. There is no heir apparent; all the Shah's surviving brothers are automatically excluded from the succession by the constitution as amended in 1925 to exclude from the succession anyone with Qajar blood.

DEFENCE. The armed forces, of which the Shah is Commander-in-Chief, consist of the army, navy, and air force. For administrative purposes they come under the ministry for war. The Conscription Act of 1925 introduced compulsory military service, which is normally for a period of 2 years, except for univ. graduates, who serve for 1 year. The main garrisons are in Tehran and the prov. caps. A U.S. military mission is attached to the army, which is in the process of reorganisation. The navy comprises a number of gunboats on the Persian Gulf and the Caspian Sea. A small air force is attached to the army. A staff college, officers' training college, and a number of schools are run by the ministry of defence. Internal security in the towns is the responsibility of the police, and in the rural dists. of the gendarmerie, both of which are under the ministry of the interior.

JUSTICE. Prior to the constitution there were 2 systems of law, the religious law (the *shari'a*) and customary law (*'urf*). By the Law of the Principles of the Organisation of Justice of 1912, which laid the foundations of the present system, the courts were classified as general or special in accordance with the Supplementary Fundamental Laws of 1907. During the reign of Reza Shah the *shari'a* courts fell into disuse. The main general courts are the dist. courts, above which are the courts of first instance, the prov. courts of appeal, and the court of cassation in Tehran. The Law of the Principles of Civil Procedure was reformed in Jan. 1953. A civil code was promulgated during the early years of the reign of Reza Shah. As regards personal law it is based on the *shari'a*; in other matters it is strongly influenced

won over to the Mazdakite movement, a heretical movement which derived its support largely from the socially disaffected classes. He was deposed but regained his throne in 498 or 499. He was succeeded by Khusraw I (Anushirawan, 531-79), who put down the Mazdakite movement and restored the power of the empire. Under Khusraw II (590-628) the war with Rome was renewed, Armenia was retaken, and in 610 Khusraw II reached the Bosphorus, took Antioch, Damascus, Jerusalem (611), and Gaza (616); he invaded Egypt, and marched up the Nile to the borders of Ethiopia; and a Sasanian gen. besieged Constantinople. Heraclius counter-attacked, liberated Asia Minor, invaded Armenia, and seized Ctesiphon. Khusraw II fled and was assassinated. The decline of the empire after Khusraw II was rapid. Princes who were puppets in the hands of the military leaders followed each other to the throne in rapid succession. With the accession of Yazdigird III (632-51) peace was concluded with Rome. Meanwhile the Arabs had begun to erupt from Arabia. The Sasanian empire, exhausted by war and taxation, was in no position to resist their advance effectively. The battles of Qadisiya (637) and Nahavand (642) were decisive. Yazdigird fled and was assassinated near Marv in 651. P. became incorporated in the dominions of the caliphs and was ruled from first Medina, then Damascus, and finally Bagdad (c. 750). The pop. was converted to Islam. The appeal of the Abbasid propaganda, which had resulted in the estab. of the Abbasid caliphate and the transfer of the cap. to Bagdad, had been largely to the Persians and the Shi'ites (q.v.), although the movement had relied on the Yemenite Arabs for its main support. The estab. of the Abbasid caliphate, however, failed to satisfy the hopes of its Persian supporters, and a series of politico-religious revolts broke out in P. Under Mahdi (775-85) and Hadi (785-6) Persian influence increased and Persians played an important part in the administration. Under Harun (786-809) (see HAROUN AL-RASCHID) semi-religious revolts broke out again, and on his death civil war broke out between his sons, Amin and Ma'mun. The latter had been viceroy in the E., and largely by means of the support he received from the E. he succeeded in establishing himself as caliph in 813. During his rule (813-20) his gen., Tahir, estab. a dynasty in Khurasan. In the provs. bordering the S. shore of the Caspian Sea there had been sporadic revolts, and c. 864 an Alid dynasty was estab. in Tabaristan, to be eventually overthrown by the Samanids (q.v.). The Tahirids were in due course defeated in 872 by Ya'qub b. Laith, the Saffarid, who had risen to power in Sistan. The Saffarids were in turn defeated by the Samanids, the centre of whose domains was Transoxania. Under Ishaq (892-907) the Samanids extended their power over the greater part of P. The W. provs. were lost under his successors to the Buyids, who had risen to power under the Ziyarids of Gurgan, c.

930; in the E. the Samanids were eventually succeeded by the Ghaznavids. The Buyid, Mu'izz ud-Dawla, entered Bagdad in 945, and reduced the caliph to the position of a puppet. The Buyids, although they were Shi'ites, allowed the caliphs to continue in office, but from this period onwards, until the overthrow of the caliphate by the Mongols in 1258, the caliph ceased to exercise effective sovereignty, and merely acted as the titular head of Sunni Islam, legitimating the authority of the various rulers. The Buyids estab. branches in various provs., including Fars, Iraq, and Kerman. They were much subject to internecine strife, and their domains eventually fell piecemeal to the Ghaznavids, Seljuqs, and others. The founder of the Ghaznavid dynasty was the Turkish slave, Sebuktigin, who was appointed governor of Khorasan in 994 by the Samanid, Nuh. Sebuktigin was succeeded by his son, Mahmud (998-1030) (see MAHMUD OF GHAZNA), who is chiefly famous for his expeditions to India. Mahmud's court became the centre of the Persian literary revival which had begun under the Samanids; Firdawsi (q.v.) wrote the *Shahnama* during his reign. Mahmud's son and successor, Mas'ud (1030-40), was defeated at the battle of Dandegan (1040) by the Ghuzz Turks, under the leadership of the Seljuqs (q.v.). One of these, Tughril Beg, entered Bagdad in 1055 and was proclaimed sultan. The migration of the Ghuzz Turks into Persia under the Seljuqs altered the balance of pop. in Persia, the Turkish element becoming from then onwards important. Under the rule of the Great Seljuqs the main lines of the administrative and economic structure of the country, which lasted in its essentials down to the 20th cent., were laid, the most important institution being the land assignment. Tughril Beg was succeeded by Alp Arslan (1063-72) and Malikshah (1072-92), under whom the dynasty reached its height. The last of the Great Seljuqs, Sanjar (1117-57), was overthrown by renewed invasions of Ghuzz from Central Asia. The Great Seljuqs were followed in Persia by a number of succession states, including the Seljuq dynasties of Iraq and Kurdistan (extinguished 1194), and Kerman (extinguished 1187), the Atabegs of Azarbaijan (1136-1225), the Selgharids of Fars (1148-1287), and the Khwarazmshahs (c. 1127-1231). The Khwarazmshah, Ala ud-Din Muhammad (1199-1220), reduced the greater part of P. to his obedience. During his reign the Mongols of Genghis Khan (q.v.) appeared on his N. borders; his son, Jalal ud-Din Mangubirni, was finally defeated by them in 1231. The final conquest of P. by the Mongols did not take place until some years later under the grandson of Genghis Khan, Hulagu, who founded the Ilkhan dynasty of P. Hulagu entered Bagdad in 1258 and brought the Abbasid caliphate to an end. The Ilkhans ruled first as vassals of the Great Khan in Qaraqorum, but with the accession of Hulagu's son, Abaqa (1265-81), they broke away and

ruled as a Persian dynasty. Internal weaknesses became apparent during the reign of Abu Sa'id (1316-35); after his death the empire began to disintegrate, the Jalayirs establishing themselves in Iraq and Azarbaijan, the Muzaffarids in Fars, the Sarbadarids in Khorasan, and the Karts in Herat. These various dynasties were extinguished by Timur (Tamerlane) (q.v.), who invaded P. in a series of campaigns between 1381 and 1387. The empire founded by Timur disappeared in W. P. and Iraq on his death, falling first to the Turkomans of the Black Sheep and then to the Turkomans of the White Sheep; the E. part of Timur's empire disintegrated on the death of Shahrukh in 1447, passing into the hands of the Uzbeks.

The beginning of the 16th cent. saw the foundation of the Safavid Empire, when P. once more became a political unit. The Safavids traced their descent from the seventh imam, Musa al-Kazim (d. 799). The name of the dynasty is taken from their ancestor, Shah Safi ud-Din, the leader of a dervish order in Ardebil. The foundations of the Safavid state were laid by Shah Isma'il (1502-24), who, at the head of a confederation of Turkoman tribes, defeated the White Sheep Turkomans in 1502, made Tabriz his cap., and conquered P., advancing to Herat in the E., and establishing in the W. a common frontier with the Ottoman Empire on the Euphrates. He estab. Shi'ism as the official religion of the country. In 1514 Selim the Grim defeated Isma'il at the battle of Chaldiran, entered Tabriz, and took Diyar Bakr. There were subsequently many wars over the Turko-Persian frontier provs., and dists. changed hands frequently. Bagdad was conquered and Mesopotamia annexed to the Turkish Empire in 1638. The Perso-Turkish wars were embittered by religious antagonisms between the Shi'ite Safavids and the Sunni Ottomans. The N.E. frontier was contested by the Uzbeks, and Afghanistan was alternately part of India and part of P., until it became independent under the Durrani dynasty in 1747. Shah Abbas (q.v.) moved the cap. from Qazvin, where it had been under Shah Tahmasp, to Isfahan. During the Safavid period various European embassies reached P. Rivalry became acute during this period between the Brit. and the Dutch in the Persian Gulf. In the early 16th cent. 'factories' were estab. by the E. India Company in the Persian Gulf. Under the successors of Shah Abbas the Persian empire declined. In 1717 the Saduzai revolted in Herat and declared themselves independent; the Uzbeks raided Khorasan; and the Arabs of Muscat seized Bahrain, which had been conquered by Shah Abbas. In 1721 the Afghans under Mahmud seized Kerman, and in 1722 defeated the Persians outside Isfahan. Turkey thereupon seized Tiflis, Tabriz, and Hamadan, and Peter the Great occupied Shirvan and Gilan. Nadir Shah Afshar (q.v.) eventually evicted the Afghans in 1729 and restored Tahmasp II to the throne. In 1732 he

deposed Tahmasp in favour of his infant son, Abbas III, and in 1736 assumed the crown himself. Nadir Shah succeeded in freeing P. from her enemies and in restoring her power temporarily. The rule of his successors, however, ended in anarchy. Eventually Karim Khan Zand estab. his supremacy and ruled from 1750-79 over all P. except Khorasan. On his death Aqa Muhammad Khan Qajar (d. 1797), after another period of anarchy, founded the Qajar dynasty.

Having estab. himself as the most powerful ruler of P., Aqa Muhammad Khan attempted to curb the Russian advance. He demanded that the Georgian tsar, Heraclius, who had entered into an agreement with the Empress Catherine in 1783, should return to his position as a vassal of P. When the demand was refused, Aqa Muhammad Khan invaded Georgia and sacked Tiflis (1795). In the following year Russia marched against P. in retaliation, but on the death of the Empress Catherine the Russian forces retired, retaining possession only of Baku and Darband. Aqa Muhammad Khan was succeeded by his nephew, Fath Ali Shah (1797-1834). Russian expansion in the Caucasus was resumed and war broke out again between P. and Russia. Meanwhile the British and French were severally seeking treaties with P. A political and commercial treaty was concluded with P. by Malcolm on behalf of Britain in 1800. Its main purpose was to ensure that the Shah did not receive Fr. agents and would do his utmost to prevent Fr. forces entering P. In view of the defeat of Napoleon in Egypt the treaty was not ratified. Subsequently the French made proposals to P. for an alliance against Russia; in 1807 the Treaty of Finkenstein was concluded, and a Fr. military mission was sent to P. A counter mission was sent from India under Malcolm 'to detach the court of Persia from the French alliance, and to prevail on that court to refuse the passage of French troops through the territories subject to Persia, or the admission of French troops into the country.' If that could not be achieved, it was to prevail upon P. 'to admit English troops with a view to opposing the Fr. army in its progress to India, to prevent the creation of any maritime post, and the establishment of French factories on the coast of Persia.' A mission from Whitehall under Harford Jones arrived almost simultaneously. Malcolm returned to India, and Harford Jones negotiated a preliminary agreement with P. in 1809. Following on this agreement, Malcolm came on a third mission in 1810, bringing with him 2 officers to assist in the reorganisation of the Persian army. In 1812 the war with Russia was resumed. The Brit. envoy sought to restore peace but failed. The war ended with the Treaty of Gulistan (1813), by which P. ceded Georgia, Qara Bagh, and 7 other provs. Brit. policy continued to be exercised by the possibility of a Russian advance through P. on India, and in 1814 the Treaty of Tehran, based on the preliminary agreement of

1809, was concluded. By this treaty all European armies were to be prevented from entering P. if hostile to Great Britain, and Great Britain undertook to provide troops or a subsidy in the event of unprovoked aggression on P. When war broke out again with Russia in 1825, the treaty remained inoperative because P. was technically the aggressor. The Russian war was concluded by the Treaty of Turkomanchai (1828), by which P. ceded Erivan and Nakhjivan and agreed to pay an indemnity, and was prohibited from having armed vessels on the Caspian Sea. During the reign of Fath Ali Shah war also broke out with Turkey, and was concluded by the Treaty of Erzerum in 1823. In the E. Fath Ali Shah endeavoured to restore Persian control over Khoraasan and Afghanistan, and in 1830 an expedition set out under Abbas Mirza, with Russian encouragement. Quchan and Sarakhs were recaptured. Herat was besieged, but on the death of Abbas Mirza the siege was raised. After the accession of Muhammad Shah in 1834 the Afghan war was resumed, again with the encouragement of Russia, whose influence had increased at the Persian court since the Treaty of Turkomanchai. Herat was besieged again in 1837; but when the Shah was threatened with Brit. intervention, Brit. policy having by this time come to regard Afghanistan as an important link in the defence of India, the siege was raised. In 1847 the Treaty of Erzerum with Turkey led to the delimitation of the Turko-Persian frontier. In 1844-5 the Babi sect was founded (see BAHÁ'Í).

Muhammad Shah d. in 1848. His son, Nasir ud-Din, who succeeded him, was faced by various movements of insurrection, one of which, in Mashhad, was not put down until 1850. Three Babi revolts broke out between 1848 and 1850, and the leader of the sect, the Bab, was executed. In 1852 an attempt on the life of the Shah by 3 disaffected Babis led to fresh persecutions. Russian influence meanwhile increased, P. being used by Russia to further her designs against Afghanistan and Turkestan. The seizure of Herat by P. led to the Anglo-Persian war of 1856-7. After the Brit. occupation of Kharg Is. and military operations on the Karun R., Herat was evacuated, and the war terminated by the Treaty of Paris in 1857. Internally changes were beginning to take place in P. In 1851 the first modern school, in which European sciences were taught, was opened. In 1862 an agreement was concluded for the Anglo-Indian telegraph line to connect India with England via P. The original line through Turkey was eventually superseded by the Indo-European telegraph, which went through Russia, and was in operation in 1872. Nasir ud-Din visited Europe in 1873, 1879, and 1889. In 1882 the Persian Cossack Brigade was formed. It was officered by Russians, who were nominated by the general staff of the military dist. of the Caucasus army, but were subject to the Persian minister of war. In 1888 the Karun R. was

declared open to international navigation. Messrs Lynch Bros. estab. a steamer service between Muhammerah and Ahvaz. In 1889 the Imperial Bank of Persia was founded, with the exclusive right to issue bank-notes. It operated under a concession which it had acquired from de Reuter, a naturalised Brit. subject, who had been given permission to found a Persian state bank when an absurdly wide concession granted to him in 1872 had been withdrawn. In 1889 the Banque des Prêts de Perse, a subsidiary of the Russian State Bank, was opened. In the same year Russia obtained the first option of a railway concession, and this in the following year was changed into an agreement prohibiting all railways in P. In 1891 a tobacco concession was granted to a Brit. subject. This concession met with the resistance of the Persian people, who were convinced that the rights of P. were being sacrificed by this and other concessions. Strikes and riots broke out; and in 1892 the Shah was forced to rescind the concession. In 1891 a Perso-Russian tariff treaty was concluded, which led to an increase in Russian trade in P. In 1896 Nasir ud-Din was assassinated. He was succeeded by his son Muzaffar ud-Din. During the latter years of Nasir ud-Din poverty and misgov. had increased. The severity of his rule, however, had, for the most part, prevented public manifestations of discontent. Small groups of people had met in secret during his reign to study liberal ideas current in W. Europe. After the accession of Muzaffar ud-Din the numbers of these groups increased, and they began openly to disseminate liberal ideas. Their efforts were reinforced by the activities of Persian communities outside P. Financial troubles beset the rule of Muzaffar ud-Din from the beginning. Negotiations for a Brit. loan were entered into but proved abortive. In 1898 a number of Belgians were appointed to reorganise the customs, and in 1900 a loan was obtained from the Russian Banque des Prêts and guaranteed by the customs receipts, except those from the customs of Fars and the Gulf Ports, which had already been pledged to guarantee a loan raised to compensate the concessionaires of the tobacco concession. The Shah then set out on his first tour of Europe. In 1901 a Brit. subject, d'Arcy, was granted the right to prospect for and exploit oil. In 1902 a second Russian loan was negotiated, and a concession granted to Russia for the construction of a road from Julfa to Tehran; various advances were made and subsidies granted by Russia to P. in the immediately succeeding years. In 1902 the Shah made his second European tour. In 1903 a new customs tariff was concluded with Russia, which led to a further increase in Russian trade with P. The new tariffs caused discontent and riots. A movement for the dismissal of the Belgian customs officials failed; another Belgian, M. Naux, was appointed Director of Customs (1903) and Minister of Posts (1904). In 1905 the customs tariff was

enforced with greater severity. Opposition to the gov. spread and disturbances took place. A number of merchants and members of the religious classes took refuge (*hast*) in Tehran and at the shrine of Shah Abd ul-Azim, demanding the dismissal of the unpopular Prime Minister, Ain ud-Dawla. After some 6 weeks the Shah promised to accede to their demand for an advisory body, to consist of representatives elected by the religious classes, the merchants, and the landed proprietors, and to be presided over by the Shah (Jan. 1906). When this promise was not fulfilled the religious leaders began to denounce the rule of tyranny. Riots ensued; the bazaars were closed; and there was an exodus of the religious classes, merchants, and artisans to Qom. 12,000 persons meanwhile took refuge in the Brit. legation. In face of the intransigence of the Shah and his advisers, the reform party eventually demanded a constitution, and in Aug. 1906 their demand was granted. Elections proceeded, and on 7 Oct. 1906 the National Assembly was opened.

Muzaffar ud-Din d. in 1907, and was succeeded by his son, Muhammad Ali. In that year the Anglo-Russian Convention dividing P. into spheres of influence was announced. The convention contained a mutual undertaking to respect the integrity and independence of P.; Great Britain gave an undertaking not to seek or support others seeking political or economic concessions in an area in the N.; Russia gave a similar undertaking with regard to an area in the S.; in a central area both powers were free from such restraint, and existing concessions were to be maintained. The main object of the British Government in concluding the convention was to limit Russian encroachment. The conclusion of the convention nevertheless caused great resentment in P. The country, meanwhile, was in a disturbed condition, and a number of revolts broke out, including an attempt by the Shah's brother, Salar ud-Dawla, to secure the throne. From the beginning Muhammad Ali sought to overthrow the National Assembly, and in Dec. 1907, with the help of the Cossack Brigade, he made an abortive attempt to destroy it. The provs. and local councils rallied to the defence of the constitution. Their triumph, however, was short-lived. Relations between the Shah and the National Assembly continued to be strained. In June 1908 the Shah proclaimed martial law, and sent an ultimatum to the National Assembly threatening to bombard it, a threat which was carried out some days later by Colonel Liakhoff, the commander of the Cossack Brigade. Many of the leading constitutionalists (or nationalists as they were called) were captured and executed. Resistance was continued by the nationalists in Tabriz for some 10 months, until Russian forces entered the city on the grounds of facilitating the entry of provisions and of protecting foreign consulates and subjects. The resistance of Tabriz gave the nationalists elsewhere

time to reorganise. Risings took place in the provs., notably at Rasht and Istahan, and finally the Bakhtiari marched on Tehran. Muhammad Ali was deposed, and Ahmad Shah placed on the throne with a regency in July 1909. Considerable bodies of Russian troops remained in N. Persia, and in 1911 the ex-Shah made an abortive attempt, with Russian encouragement, to regain the throne. Salar ud-Dawla rebelled again in 1911 and 1912. The financial situation had meanwhile further deteriorated, and in 1911 an American, Morgan Shuster, was appointed treasurer-general. In the same year the gendarmerie was reformed under Swedish officers. Shuster's appointment met with Russian opposition, and at the end of the year a Russian ultimatum was presented to the Persian gov. for his dismissal; when Russian troops began to march on Tehran the Persian Gov. capitulated, Shuster was dismissed, and the constitution suspended. In the following year Russian troops bombarded the shrine of the Imam Riza at Mashhad. The Anglo-Russian Convention thus failed in its major purpose. Russian influence continued to increase throughout P. and internal conditions to deteriorate. On the outbreak of the First World War P. proclaimed her neutrality, but this was, in fact, violated variously by herself, the Central Powers, and the Entente.

P. suffered from encroachments in the NW. and W. by Turkey and Russia. In 1915 Russia occupied Urumia. In Khuzistan there were Brit. operations to protect the Anglo-Persian Oil Company's pipeline, the d'Arcy concession of 1901 having been acquired by the company in 1909. After the fall of Kut there was a Turkish invasion in the SW. Ger. agents were meanwhile active in S. and Central P., and the Swedish officers of the gendarmerie virtually acted on behalf of the Germans. Bushire was occupied by the British in 1915, but later in the year the Brit. consulate in Shiraz was forced to surrender to enemy forces. In 1915 the Russians landed at Enzeli, advanced on Qazvin, and conducted successful operations in the neighbourhood of Hamadan, Qom, and Kashan. In E. P. a cordon was estab. by the Entente with locally recruited levies. In the following year the struggle between Russia and Turkey ebbed and flowed in W. P.; in S. P. the South Persian Rifles were formed under Brit. officers. In 1917 the Qashqa'i tribe rose in S. P. in favour of the Central Powers, and hostility to Britain increased throughout the country. The Qashqa'i were in due course defeated; and after the recapture of Kut and the occupation of Bagdad by Brit. forces, the Turks evacuated Kermanshah. The abdication of the tsar in 1917 was followed by the disorganisation and demoralisation of the Russian troops in P., who gradually withdrew, plundering as they went. With the collapse of Russian resistance the possibility of an advance by the Central Powers through S. Russia was feared. To forestall such an eventuality the

Dunsterville Mission set out for Tiflis in Jan. 1918. It was unable to get through at the first attempt because the Bolsheviks were in control of Enzeli, and a Persian rebel, Kuchik Khan, was active in Gilan. Subsequently the latter was defeated and the Dunster Force set out for Bakn. Another force under Lt-Gen. Malleson was sent to Transcaspia. In the first instance it was charged with the task of taking over the section of the E. Persian cordon vacated by Russia. It finally withdrew from Transcaspia in 1919. Thus, at the end of the war, a state of disorder prevailed in P. In an attempt to remedy this the Anglo-Persian Agreement was signed in 1919. This agreement recognised the independence and integrity of P., and provided for military advisers, a loan, and co-operation for the improvement of communications. A revision of customs tariffs was also envisaged. In 1920 Armitage-Smith was engaged as financial adviser. Meanwhile in April 1920 the Bolsheviks again invaded Enzeli and occupied Rasht, and a revolutionary gov. was set up in N. P. under Kuchik Khan.

In 1921 a successful *coup d'état*, organised by Reza Khan, an officer of the Cossack Brigade, and Sayyid Zia ud-Din Tabataba'i, took place. One of the first actions of the new gov. was to conclude the Perso-Soviet Treaty of 1921, by the terms of which the Soviet Gov. declared all treaties and concessions concluded with P. by the Tsarist gov. to be null and void, but made it a condition that these concessions should not be ceded to a third power by P. Under Article VI the U.S.S.R. was permitted 'to advance her troops into the Persian interior for the purpose of carrying out the military operations necessary for its defence' in the event of a third party attempting 'to carry out a policy of usurpation by means of armed intervention in Persia, or if such a Power should desire to use Persian territory as a base of operations against Russia...'. As explained in a letter from the Russian diplomatic representative in P. to the Persian minister of foreign affairs, this was intended to apply to attacks by partisans of the Tsarist regime and its supporters among foreign powers. Meanwhile the new National Assembly refused to ratify the Anglo-Persian Agreement of 1919, which had also been unfavourably received in France and the U.S.A. The active measures taken by Sayyid Zia ud-Din to create an orderly administration quickly aroused opposition. Reza Khan quarrelled with him and overthrew him. The former had meanwhile as Minister of War begun to pacify the country; the movement of Kuchik Khan in Gilan collapsed owing to internal dissensions and the withdrawal of Bolshevik support. In 1923 Reza Khan became Prime Minister, and finally in 1925 Ahmad Shah was deposed and the crown of P. conferred on Reza Khan as Reza Shah Pahlavi. By 1926 the pacification of the country had been virtually achieved. Communications were im-

proved and financial reforms were carried out. In 1922 an American, Dr Mills, had been appointed Administrator-General of the Finances, and the mission of which he was the head gradually succeeded in centralising the financial administration of the country, in balancing the budget, and in reviving the economic life and trade of the country; a beginning was also made on the Trans-Iranian railway, and provision made for the estab. of a National Bank. By 1926, however, there was mounting tension between the mission and Reza Shah, who, with the army, was increasingly diverting the revenue of the country away from the normal channels, and in 1927 Dr Mills was dismissed. Reza Shah next turned his attention to foreign affairs. In 1927 a claim to Bahrain was revived, but was rejected by H.M. Gov. This claim has since been repeated from time to time. In the same year the Caspian Fisheries Concession was given to a joint Soviet-Persian company. In 1928 the capitulations (q.v.) were abolished. Various measures followed designed to normalise relations between Great Britain and P. Thus, the duties which Great Britain had hitherto performed in the Persian littoral of the Persian Gulf in connection with light and quarantine duties were handed over to P. In 1931 the Indo-European Telegraph Company withdrew almost completely from P.; and in 1935 the Brit. coaling stations at Basidu and Henjam were transferred to Bahrain. In 1932 Reza Shah denounced the Anglo-Persian Oil Concession. The question was referred to the League of Nations, but was settled by negotiations between the company and the Persian Gov. By an agreement signed in 1933 the concession area was reduced to 100,000 sq. m. in S. and SW. P., and the royalty payment increased; in return the Persian Gov. extended the concession till 1993, and undertook not to cancel or modify the concession unilaterally and to submit to arbitration any disputes which the parties could not settle themselves. In 1937 the Sa'dabad Treaty, a mutual pact of friendship and non-aggression, was signed between P. (Iran), Turkey, Afghanistan, and Iraq.

In internal affairs Reza Shah pursued a policy of extensive modernisation. The army was expanded and conscription was introduced; new civil service laws were passed; the administration of justice was reformed; the system of education was reorganised; women were unveiled (1936); industrialisation was encouraged; communications were improved, and the Trans-Iranian railway was built; foreign trade was made a state monopoly (1931); this and the general organisation of Persian trade fitted in with Ger. economic methods, and in the years immediately preceding the Second World War Ger. commercial and political influence in P. increased. The outward forms of constitutional gov. were preserved by Reza Shah, but in fact he imposed a dictatorship upon the country, the effect of which was increasingly felt in



all aspects of the life of the country. On the outbreak of the Second World War P. declared her neutrality.

After the collapse of the Rashid Ali movement in Iraq and the defeat of the Vichy forces in Syria by Brit. and Free Fr. forces, the Brit. and Russian Govs. turned their attention to the dangerous situation which was arising in P. through the large number of Ger. nationals in that country. P.'s safety was a vital interest of Great Britain and Russia alike, particularly by reason of Brit. interests in the Anglo-Persian oilfields and of the proximity to P. of Russia's great oilfields in the Caucasus. The danger was the more obvious from the pressure of the Ger. invading armies through the Ukraine and the possibility that, at any moment, Germany might, if thwarted in the Ukraine, attempt to force a passage to P. through Turkey (Anatolia). In the summer of 1941 the two allied govs. requested the Persian Gov. to reduce the number of Ger. nationals in the country. On 24 Aug., having failed to get satisfaction, they demanded the expulsion of all Ger. nationals except such as were essential to the Persian economy and harmless to the allies. The Persian Gov. failed to comply, and on 26 Aug. Soviet forces crossed the Persian frontier and advanced in the direction of Tabriz and Ardebil; Brit. forces landed at Bandar Shapur and another column advanced from Khamanlu toward Kermanshah. A perfunctory resistance only was offered. After 2 days hostilities ceased.

On 10 Sept. the Persian Gov. accepted the Brit. and Soviet armistice terms. These included the closing of the Ger., It., Hungarian, and Rumanian legations, and the handing over to the Brit. and Soviet authorities of Ger. subjects. On 16 Sept. Reza Shah abdicated in favour of his son, Muhammad Reza. In Jan. 1942 a Tripartite Treaty of Alliance was concluded with Great Britain and the U.S.S.R., whereby Great Britain and the U.S.S.R. undertook jointly and severally 'to respect the territorial integrity and sovereignty and political independence of Iran' and 'to defend Iran by all means at their command from aggression.' The Persian Gov. undertook to co-operate with the Allied powers in every way possible in order to enable them to fulfil their undertakings, and to give the Allies, for certain military purposes, the unrestricted right to use, maintain, and guard, and, in cases of military necessity, control, all means of communication in Persia; to assist in obtaining material and recruiting labour, and to establish a censorship. The Allied powers were permitted to maintain land, sea, and air forces on Persian ter., but their presence was not to constitute a military occupation. The Allied forces were to be withdrawn not later than 6 months after all hostilities between the Allied powers and Germany and her associates had ceased. The Allied powers undertook not to interfere in the internal affairs of P. and jointly 'to use their best endeavours to safeguard the economic existence of the Persian

people against the privations and difficulties' resulting from the war.

P. declared war on Germany on 9 Sept. 1943. After the Tehran Conference President Roosevelt, Marshal Stalin, and Winston Churchill issued a declaration (1 Dec.) in which their 3 govs. recognised Persian assistance, undertook to give P. economic aid where possible, and confirmed their desire for the maintenance of Persian independence, sovereignty, and territorial integrity. Allied objects were achieved in respect of the use of Persian communications, but P. was in practice divided into 2 zones, and Soviet action made effective administration by the Persian authorities impossible in the N. zone. In the summer of 1943 Amer. non-combatant technical troops, who were introduced as part of the Brit. forces, took over from the Brit. the administration of the Trans-Iranian railway from the Persian Gulf to Tehran; from Tehran to the N. it continued to be run by the Soviet authorities. Meanwhile P.'s internal situation deteriorated. Amer. advisers were appointed in 1942 and 1943 to the Dept. of Food, the Ministry of Finance, the gendarmerie and police; a military mission was appointed in 1942. Dr Millsapugh, who became Administrator-General of the Finances in 1943, met with opposition from various internal quarters, and was unable to secure Soviet co-operation; he resigned in Feb. 1945. In 1943 and 1944 the Royal Dutch Shell, Socony Vacuum, and Sinclair Oil Companies, and the Soviet Gov. (1944), asked for oil concessions. The Persian Gov. announced in Sept. that the grant of oil concessions must wait till the end of the war, and in spite of Soviet pressure refused to give way on this point. From this period onwards Soviet pressure on P. became more open. In the autumn of 1945 Persian security forces were prevented from entering Azarbaijan and the Caspian provs., and in Dec. the Tudeh party, which had been formed in 1943 and become increasingly an instrument of Soviet policy, was reformed as the Democrat party and set up an autonomous gov. in Azarbaijan. About the same time there was a Kurdish movement for autonomy in Mahabad, also with Russian encouragement. The Persian Gov. protested against the Soviet actions, and finally had recourse to the Security Council in Jan. 1946. The council approved direct negotiations by the 2 parties. The Prime Minister went to Moscow, but failed to reach an agreement. On 2 Mar. the Tripartite Treaty expired; Soviet forces remained, although the evacuation of Brit. and Amer. forces had taken place. The Persian Gov. brought the matter to the notice of the Security Council. Finally, after the Soviet Gov. had extracted an oil agreement from the Persian Prime Minister, Qavam, during a visit to Moscow, the evacuation of the Soviet forces was completed (9 May). Negotiations then began between the Democratic party of Azarbaijan and the Persian Gov. In July 1946 a general strike was organised by the Tudeh party in Abadan. By

Sept. a confederacy of tribes in the S. was demanding autonomy such as that in Azarbaijan and had gained control of most of Fars. Partly in response to this pressure the gov. was reformed, and finally Persian forces marched on Azarbaijan. The Democrat party collapsed, as also did the Kurdish movement. The authority of the Central Gov. was re-estab. A new National Assembly was convened, and in Oct. it ruled that the Soviet oil agreement was null and void, and forbade the grant of oil concessions to foreign govts. A period of Soviet-Persian tension ensued. In Oct. 1947 a Perso-Amer. military agreement was signed, providing for a U.S. military mission to co-operate with the Persian minister of war in 'enhancing the efficiency of the Iranian army.' This provoked an exchange of notes with the U.S.S.R., who protested vigorously. In 1949 a member of the Tudeh party made an attempt on the Shah's life. The party was thereupon declared illegal. A constituent assembly met in April and amended the constitution to enable the Shah to dissolve the National Assembly and the Senate by decree. In 1950 P. received a loan from the Export and Import Bank of Washington, and a grant under the Point IV allocation. In 1948 a Seven-Year Plan for economic reconstruction, based on a report of a mission of U.S.A. engineers, was pub., and Overseas Consultants Incorporated were invited to act in an advisory capacity. In 1950 their contract was terminated; the plan, however, continued in existence. In 1949 a Supplemental Agreement with the Anglo-Iranian Oil Company, by which the total payments to P. would have been considerably raised, was initialled. In Nov. 1950 the Oil Commission of the National Assembly reported against it. Opposition to the agreement, led by Musaddiq, supported by the National Front, the mulla, Kashani, and the Fidayani Islam, was complicated by the highly unsatisfactory economic and political conditions which prevailed in P. The Prime Minister, Razmara, was assassinated in Mar. 1951. In April a Bill for the nationalisation of the oil industry was passed and in the same month Musaddiq became Prime Minister. The Brit. Gov. and the Anglo-Iranian Oil Company, severally, filed petitions with the International Court, the former asking it to declare P. bound by the 1933 agreement, and the latter asking it to nominate an arbitrator. The Persian Gov. refused to recognise the Court's jurisdiction. Great Britain referred the matter to the Security Council in Oct. 1951. Repeated efforts by the company, Great Britain, the U.S.A., and the International Bank to find a solution failed. The anti-Brit. campaign in P. meanwhile increased in virulence. Early in 1952, following a demand from the Persian Gov., all Brit. consulates in P. were closed. U.S.A. military aid to P. was suspended in Jan. but resumed in April in view of assurances given by Musaddiq. In Jan. 1952 Point IV aid was increased. In May

there were renewed protests from Russia at U.S.A. military aid. In July after a brief constitutional crisis Musaddiq returned to office as Prime Minister with increased power. In July the International Court ruled that it had no jurisdiction in the case brought by Britain. In Aug. Musaddiq was given full powers in economic, banking, judicial, administrative, military, and financial matters for 6 months, which period was subsequently extended. On 30 Aug. a joint proposal by Churchill and Truman to solve the oil dispute failed, and on 22 Oct. P. broke off diplomatic relations with Great Britain. In 1953 P.'s internal affairs deteriorated and opposition to Musaddiq grew. In June Eisenhower informed Musaddiq that no further U.S. aid would be forthcoming unless the oil dispute was settled or submitted to a neutral international body. In Aug. there was an abortive coup and the Shah fled the country. Three days later, Zahedi, who had received an imperial *firman* appointing him Prime Minister a few days before the coup, came forward as the leader of the movement against Musaddiq, assumed control, and arrested Musaddiq, who was later tried and sentenced to 3 years for treason. The new gov. asked for and received financial help from the U.S.A. Means for a settlement of the oil dispute were meanwhile explored. In Dec. Anglo-Persian diplomatic relations were resumed. Negotiations were begun in 1954 for a settlement of the oil dispute, and finally in Sept. a new agreement was signed between the Persian Gov., the National Iranian Oil Company, and an international consortium formed by 7 leading oil companies, and the Brit. Petroleum Oil Company (formerly the Anglo-Iranian Oil Company). Internally during 1955 and 1956 P.'s efforts were mainly devoted to reviving the economy of the country. The second Seven-Year Plan Law, passed in 1956, envisages an expenditure of \$936 million over seven years (starting 1955), to be financed from oil revenues. In Oct. 1955 P. joined the Bagdad Pact (q.v.). In June 1956 the Shah visited the U.S.S.R.

ANTIQUITIES. From the SW. of P. come the bronze ornaments and arms, called after the place where they were found, the Luristan bronzes, and from Elam come cuneiform inscriptions. Sev. empires ruled over P., and each had its cap. or caps., some of which are still hidden under mounds of earth. In the Achæmenid towns, Persepolis and Pasargardæ, the palace was built on an artificial platform, and many of the walls were covered with bas reliefs; these and the capitals of the columns are quite distinctive. Susa has been excavated and fine pottery found. The ruins of sev. Sasanian palaces have been found; they were built of brick like the greatest existing example of such work, the arch of Ctesiphon, which is in Iraq. In some bridges the lower courses are Sasanian, though the upper works may be later. Some 30 rock-cut tombs, like the Naqsh-e Rostam, belong to this period. Weaving must

have been an important industry, for the Achaemenid palaces needed harings; little Sasanian work has survived, but the sculptures give an idea of the patterns which were copied by Byzantine workers. Sculpture in the round was not unknown, for a broken statue of a king lies in a cave. Recent excavations at a prehistoric site in Azerbaijan revealed a stratified sequence of material, chiefly pottery, dating from the beginning of the 3rd millennium to about 1000 BC. A number of previously unknown types were found, as well as varieties like the earliest material found at Ur, in the Aegean, and in Minoan Crete. At Behistun, E. of Kermanshah, is the inscription in 3 languages set up by Darius (521-485 BC) which gave the clue to the decipherment of the cuneiform script.

**LANGUAGE AND LITERATURE.** The Persian or Iranian language forms a sub-branch of the Indo-Iranian or 'Aryan' main branch, belonging to the Indo-European (q.v.) linguistic family. The most important common characteristics of the language making it differ from Sanskrit, belonging to the other sub-branch of the Indo-Iranian main branch, are as follows: change of the original *s* into the spirant *h*; change of original aspirants, such as *gh*, *dh*, into corresponding medials; *k*, *t*, *p* before a consonant changed to spirants *x* (*k*h), *θ* (*t*h), *φ* (*p*h); and the development of soft sibilants. Persian may be distinguished into Old Persian, used on the monuments of the Achaemenid dynasty (middle 6th cent. to the second half of the 4th cent. BC); Middle Persian of the Parthian or Arsacid period (250 BC-AD 225), and of the Sasanian period (AD 225-651), terminated by the Arab conquest; with the growth of semi-independent dynasties in P. in the 9th cent. AD. Modern Persian began to flourish.

The ancient Persian inscriptions were written in cuneiform character, which, however, was not a natural development from the Sumero-Assyro-Babylonian cuneiform writing (q.v.), but an artificial creation—probably drawn up on official order—externally based on the neo-Babylonian cuneiforms, and—as a system of writing being a quasi-alphabet—suggested by the already widely circulating Aramaic alphabet (see ALPHABET). This early Persian writing, which was the official script of the Achaemenid dynasty, and was employed from the middle of the 6th cent. BC until the destruction of the Persian Empire by Alexander the Great, consisted of 41 symbols. Four of them were ideograms (for 'king', 'province', 'country', and 'Avra-Mazda') and one a sign of div. between words; three vowels (*a*, *i*, *u*); 13 consonants (*k*h, *ch*, *th*, *p*, *b*, *f*, *y*, *l*, *s*, *z*, *sh*, *thr*, *h*) having either the value of a pure consonant or a consonant + *ā*; 10 symbols for consonants (*k* or *g*, *t*, *n*, *r*) in two forms: (1) pure consonant or consonant + *ā*, (2) consonant + *u*; 4 symbols for consonants (*ā* and *e-u*), also in two forms, but (1) pure consonant or consonant + *ā*, (2) consonant + *i*; 6 symbols for consonants (*ā*, *m*) in three forms: (1) pure consonant or

consonant + *ā*, (2) consonant + *u*, (3) consonant + *i*.

The early Zoroastrian Scriptures were called *Avesta*, a term which comes from the Middle Persian or Pahlavi (q.v.) form *avistak* (or, as some scholars prefer to read, *apastak*) or the Pāzand form *avasta*; the Sanskrit term is *avista*. The origin of this word is uncertain. The *Avesta* literature was composed in a dialect now called 'Avestic' or simply 'Avesta'; its original home is unknown. The *Avesta* literature is a complex collection of writings, containing the liturgies, the 'law', solemn invocations, prayers, and so forth, and is still in use amongst Parsees in India and in P. The script of the *Avesta*, known as the Pāzand or the *Avesta* alphabet, is a cursive writing of 50 signs, probably an artificial creation based on the local scripts. These books, with their later commentaries, constitute the bulk of pre-Islamic Persian literature.

Under the Arsacids the Gk tongue appears to have been widely used, but after the rise of the Sasanians Persian again became cultivated, and inscriptions and literature in the Pahlavi language have come down to us. Pahlavi, or rather Middle Persian, consists of Parsik of the Sasanian inscriptions, of Pahlavi of the later Zoroastrian literature up to the 9th cent. AD, and of the SW. Iranian dialect known from texts found in Turfan (E. Turkestan). They are written in Pahlavi scripts, which seem to have been a natural development from local cursive Aramaic scripts.

Modern Persian is a direct descendant of the S.-central middle-Persian dialect, but the Arabic conquest brought such a revolution in the material and spiritual life of the Persians that, to mention only one sphere of cultural life, although it did not change the fundamental structure of the language, it influenced it enormously. The Pahlavi script was forced to give way to the Arabic (although the pronunciation of some Arabic letters has been changed, and new letters were created for representing the sounds *p*, *ch*, *sh*, and *g*), and a knowledge of the Arabic language became indispensable to the converts to Islam, for religious worship and the correct reading of the Qur'an were impossible without it. In consequence Arabic speech and writing have so largely influenced modern Persian that numerous Semitic words have become part and parcel of this language. Daqiqi, who began the famous *Shah-nama* ('Book of Kings'), employs about 40 Arabic words in a thousand lines of Persian poetry, and even the great Firdawsī (see below), who represents a national spiritual reaction against foreign influence, uses a certain number of Arabic words. Besides, many Persian savants in the early centuries of the Islamic period wrote in Arabic, which remained the language of science and philosophy until the Mongol conquest (see above), and of religion until modern times. Much of the best of Arabic literature was the work of Persian writers.

Modern Persian begins as a literary language in the early 9th cent. One of the

earliest neo-Persian literary documents is a fragmentary poem attributed to 'Abbas of Merv, perhaps of AD 809, but the first great modern poet was Rudaki (d. c. AD 954). With him began what may be called the court poetry of modern P. He was followed during the 10th to the 16th cents., among others, by Firdawsi (q.v.), (d. 1020), who wrote the *Shah-nama*, the national epic of P., which incorporates the heroic legends of early Iran, Anwari (d. between 1189 and 1191), 'Omar Khayyam' (q.v.) ('Omar ibn Ibrahim al Khayyam') of Nishapur, a free-thinker, poet, astronomer, and mathematician (d. c. 1123), Nizami (d. c. 1203), Khaqani (d. 1190-1200), Sa'di of Shiraz (d. 1291), Jalal ud-Din Rumi (b. at Balkh in 1207, d. at Konya in 1273), Hafiz (d. 1389), and Jami (d. 1492). A later poet, of epic fame, is Hafiz of Jam (d. 1521), and later still is Hafiz of Isfahan, known as the singer of sweet songs (d. 1784). 19th-cent. poets of importance are Qa'ani (Mirza Habibullah) of Shiraz (d. 1853), Yaghma, and Mirza Surush, whose elegant work almost equals that of the classic poets. The earliest Persian prose work is the abridged trans. of the *Universal History* of Abu Ja'far Muhammad b. Jarir at-Tabari (d. 923) by Bal'ami (d. 996). From the 11th cent. onwards a number of Mirrors of Princes, including the *Qabus Nama* of Kay Ka'us b. Iskander (composed 1082), hist., including the *Tarikh-i Mas'udi* of Abu'l Fazl Muhammad b. Husayn al-Bayhaqi (d. 1077), part only of which is extant, scientific works, such as the *Danish Nama-i Ala'i* of Avicenna (d. 1037), religious works, such as the *Kimya us-Sa'adat* of Ghazali (d. 1111), and biographical dictionaries, such as the work of Dawlatshah (d. 1487), were written. One of the most celebrated prose works is the *Gulistan* of Sa'di (see above). The 13th and 14th cents. are also notable for the historical works of Juwayni and Rashid ud-Din Fazlullah (d. 1318). In mystic poetry the outstanding work is the 13th cent. *Mahnavi* of Jalal ud-Din Rumi (see above). There is also an abundant Persian literature belonging to Muhammadan India. Persian drama has hitherto been confined mainly to religious passion plays and translations from European works. Poetry remains to-day the most flourishing form of literature. The verse-forms are restricted with few exceptions to: (1) the *rubai'i* or quatrain; (2) the *ghazal*, a poem in couplets, interlocked by a single rhyme at the end of each couplet; (3) the *qasida*, a dedicatory poem, similar in form to the *ghazal*, but longer; and (4) the *mathnavi*, an epic or narrative poem in rhymed couplets. The recent revival of literature in P. has taken the form of hist., eds. of the classics, and poetry. Interest in novels is restricted mainly to trans. of European works, generally Fr. In the period immediately following the grant of the constitution numerous newspapers and periodicals were founded. During the reign of Reza Shah their numbers declined, but since 1942 there has again been a great increase.

Numerous Persian dialects exist; Kurd-

ish is spoken in Kurdistan, and Luri by the Lurs and Bakhtiari. Turkish dialects are spoken in Azarbaijan, and the Hamadan area, and by the Qashqa'i tribes in Fars, and the Turkoman tribes. Arabic dialects are spoken in parts of Khuzistan.

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Persian Architecture, see ARCHITECTURE, 1(b).

**Persian Art.** Persia's artistic heritage is rich and various. Forming the highway between W. and central Asia, the Iranian plateau was from the first exposed to the influence of the outside world, whether through trade or foreign invasion. In its art Persia has constantly proved its power to absorb the artistic ideas of alien civilisations and to adapt them to its own purposes.

Evidence of Persia's artistic achievements extends to the prehistoric period. During the fourth millennium BC the earliest inhab. were producing a type of painted pottery wholly original in design. When the Iranian peoples settled in Persia at the beginning of the first millennium BC, an artistic tradition was already estab. The fine bronze castings—weapons, horse trappings, and household utensils—recovered from tombs belonging to a war-like people settled in the mountainous dist of Luristan in W. Persia were among the antecedents of Achaemenid art.

The empire of Cyrus and his successors was the heir of the Assyrian and Babylonian empires; nor is it surprising that the arts of these two empires should have had a decisive influence on Achaemenid art, which was an imperial art dependant on the patronage of the imperial court. It is known to us mostly from the imposing ruins of the successive caps. of Pasargadae, Persepolis, and Susa. The palaces, constructed on a monumental scale, belong to the 'trabeate' type of architecture and owe much to the forms of Egypt and Greece. A striking feature is their sculptural decoration executed for the most part in relief. The main purpose of the sculptures was to memorialise the person and majesty of the Great King who is portrayed in the company of his counsellors, armies, and subject peoples or in single combat with a lion or some fabulous beast signifying symbolically his victory

over the forces of evil. An almost monotonous repetition of figures in no way detracts from the skill of observation displayed by the sculptor. Some idea of the Achaemenid craftsman's skill can be gained from the carved gems, seals, and vessels of precious metals of which examples have been revealed by the archaeologist.



British Museum

A STONE RELIEF FROM PERSEPOLIS  
Height 3 ft 1 in.

The conquest of the Persian empire by Alexander the Great intensified the process of the Hellenisation of art which can already be observed towards the end of the Achaemenid period and continued into the Parthian period. Under the rule of the Sasanian dynasty, P. A. once again asserted its independence by a deliberate revival of Iranian artistic idioms. Such architectural innovations as the dome set on squinches and the vault—made possible by the use of bricks—were introduced; while the great reliefs carved in rock faces are worthy successors of the Achaemenid sculptures. Metalwork, both silver and bronze, and silk weaves have survived from this period; and examples of the latter found their way to Europe, with the result that Sasanian motives were introduced into the art of the W. The influence of Sasanian art even extended to central Asia and China.

With the coming of the Arabs, P. A. had to be adapted to the needs of the

religion of Islam. Yet it succeeded in retaining its distinctive character, and even exercised a considerable influence on other countries of the Muslim world. In religious architecture, the Persians seem to have been the first to adopt the mosque based on a cruciform plan in which great niches are set into each of the 4 sides of the court. Another feature of Persian buildings, both secular and religious, is the application of polychrome

The combination of line and colour in a harmonious composition is seen at its best in the carpet—probably Persia's greatest artistic achievement. Centuries must have gone to the perfecting of the art of rug knotting, although the earliest surviving carpets date from the 16th cent. The carpets of this and the following cent. are among the finest ever produced. Some, especially those made in factories under royal patronage, depict



*Victoria and Albert Museum: Crown copyright*

**'VASE' CARPET, FRAGMENTARY**

Period of Shah Abbas I. Length 10 ft 3 in.; width 7 ft 6 in.

decoration on interior and exterior surfaces by means of glazed tiles, variegated courses of bricks, carved stone, and stucco. These techniques are skilfully used to emphasise structural features.

Sculpture of human and animal forms in the round is virtually unknown in the Islamic world, since Islam is hostile to this particular type of representational art. P. A. of the Islamic period is primarily an art of surface decoration. Designs were abstract and geometric or composed of floral ornament in which the arabesque plays a prominent role. Arabic script—one of the most decorative in the world—is often introduced into the design. Various Chinese motives, too, found their way into the decorative repertory of Persia.

hunting scenes and were woven from cartoons designed by skilled artists: others were decorated with flowers, while a group from S. Persia has boldly drawn from the Caucasus region of NW. Persia, and is decorated with highly stylised floral and animal ornament, brilliant in colour and daring in conception. Rug weaving survives to this day among the nomad peoples of Persia.

Silk weaving, already a well-established industry in the Sasanian period, continued throughout the Middle Ages and culminated in the complex and exquisite weaves of the 16th and 17th cents.

The Persian potters of the 12th and 13th cents. were producing glazed wares technically and artistically far ahead of any other country with the exception of

China and the Islamic countries of the Near E. Persian pottery combines brilliance of colour with decoration perfectly adapted to the form of the vessel. Particular mention should be made of painting in metallic lustre and underglaze painting. There was a remarkable revival of pottery at the end of the 16th and in the 17th cent.

Some measure of Persia's artistic genius is offered by the MS. miniatures which are well represented in the libraries and museums of Europe and America. Large-scale painting, such as frescoes, was practised at least as early as the Parthian period, but a few fragments only have survived. The art of the miniaturist dates from the 13th cent., and reached maturity in the 15th cent. under the rule of the Timurid dynasty, when the miniaturist combined with the scribe, illuminator, and bookbinder in producing some of the finest books ever seen. The miniatures were regarded as adjuncts to the general decorative scheme as much as paintings in their own right. The subjects illustrated were taken from epics, romances, and hist. At its best, the Persian miniature is executed in a firm yet delicate line and with a wonderful understanding of colour harmony. The artist is content to evoke a mood rather than to strive after the presentation of the interplay of action and emotion. Within these limits, his vision transforms the material world into one of exquisite form and fantasy.

**Persian Cat**, see CAT.

**Persian Gulf**, inlet from the Gulf of Oman, running northwards from the Strait of Ormuz. It covers an area of c. 97,000 sq. m., with a total length, from the coast of Oman to the head of the Gulf, of c. 600 m., and a breadth varying from 180 m. at its widest point to 29 m. at the Strait of Ormuz. On the N. side the Persian plateau rises steeply to 3000-6000 ft. The Shatt ul-Arab, formed by the union of the Tigris and the Euphrates, flows into the head of the P. G., at which is situated Fao; farther N. on the Shatt ul-Arab, is Basra. The P. G. is extremely shallow. Deep soundings range from 40 to 50 fathoms, the greatest line of depth being nearer the Persian coast than the Arabian; the S. shore, round to and beyond the Shatt ul-Arab extending to Bushire, is shallow and shelving, making it impossible for ships of 5000 tons or more to approach within 5 m. of the shore. The P. G. is complicated by a maze of shoals and reefs, and is the home of the pearl oyster, for which it was famed from early times. It contains a number of is., among them Bahrain, Qishm, and Hormuz. The climate is exceedingly hot and relative humidity high. From early times an important trade route has lain through the P. G.; the main emporium was Basra, which was superseded by Siraf in the 13th cent.; later the main centre of commerce was transferred to Qais, and in the 14th cent. to Hormuz. The Portuguese were the first European nation to secure a footing in the P. G., Albuquerque taking Hormuz and a

number of tns on the Oman coast in the early years of the 16th cent. The Eng. East India Company estab. a factory at Jask in 1619. Hormuz was taken from the Portuguese by the Persian Gov. with the help of the East India Company in 1622, after which Gombroon (Bandar Abbas) became the centre of Brit. trade in the P. G. The Dutch East India Company also estab. factories at Bandar Abbas. By the middle of the century the Dutch had attained to commercial superiority in the area, but by the end of the century their influence was on the wane. Brit. influence grew throughout the 18th and early 19th cents. The prevalence of piracy in the P. G. forced the East India Company, and later the Brit. Gov. and the Gov. of India, to attend to its suppression, and led to the estab. of Brit. protectorates of the Shaikhdoms of the P. G. The Arabian shore of the P. G. belongs partly to Saudi Arabia, and partly to the sovereign shaikhdoms of Kuwait, Bahrain, and Qatar and the smaller shaikhdoms of Trucial Oman, all of which are under Brit. protection. The main air route to the E. passes along the S. shore of the P. G. The importance of the area has been greatly enhanced by the discovery of large reserves of oil in the neighbourhood of the Arab shore of the Gulf. See Sir A. Wilson, *The Persian Gulf*, 1928; and *The Middle East* (pub. under the auspices of the Royal Institute of International Affairs), 3rd ed., 1958.

**Persicaria**, see POLYGONUM.

**Persimmon**, see DATE PLUM.

**Persius Flaccus, Aulus** (AD 34-62), Lat. poet, b. at Volaterrae. Together with Lucan he was a pupil and friend of the Stoic Cornutus. His extant works consist of 6 short satires. See the edition by J. Conington (1893), and the verse trans. (with the *Satires* of Juvenal) by W. Gifford in Everyman's Library.

**Personal Property**, in Eng. law, comprises all chattels or movables such as jewels, money, documents, furniture, and personal effects or belongings as opposed to real estate (q.v.) or interest in land (see under PERSONALTY; REALTY; INCORPORAL HEREDITAMENTS; and HEREDITAMENTS). Leaseholds or chattels-real (qq.v.) are, as their secondary name implies, a hybrid species of property; for though derived out of real estate, they have been ranked as personality and always devolve in intestacy as such (see DISTRIBUTION, STATUTES OF). P. P. is said to be either in action or in possession, as to which distinction see CHOSE IN ACTION. In Scots law the classification into heritable and movable property is almost parallel to the Eng. real and personal.

**Personality**, in philosophy, denotes that a substance is constituted a person, that is, a substance perfectly subsistent, master of its own acts, and incommunicable. A human person, therefore, is neither the body nor the soul, but the rational being arising from the substantial union of both. It is an individual able to direct itself by its intelligence and will, and is accordingly the proper object

of attribution of its acts. It is the person who eats, walks, talks, speaks, loves. While the reality of self has been denied by Hume and Bradley, modern philosophers have been principally concerned with 4 questions regarding the person: (1) Whether and how it knows itself; and the general opinion is that it knows itself by perception, i.e. by that species of awareness which we have of the existence of particulars, by a direct cognitive relation to them, and not by description. (2) The relation of P. to time; and it is agreed by most that the identity of the person persists through time, whatever theory of time be held. (3) Whether P. be simple or compound. The definition given above involves the simplicity of P. (4) Whether P. involves self-consciousness. Opinion on this is divided, though it would appear that differences are largely differences of terms, and it is safe to hold that the person is at all times fundamentally self-conscious.

P. in psychology (q.v.) has a somewhat wider connotation, signifying those collections of attributes or qualities which vary from person to person, rather than those which distinguish personal from non-personal existence. For P. in the God-head see TRINITY. See also HALLUCINATION; HYPNOTISM; ILLUSION; MEMORY. See A. Binet, *Alterations of Personality*, trans., 1896; T. A. Ribot, *Diseases of Memory*, trans., 1882; C. A. Mercier, *Psychology, Normal and Morbid*, 1901; C. G. Jung, *Psychological Types or the Psychology of Individuation*, 1923; R. Martin, *Alfred Binet, 1925*; F. L. Bertrand, *Alfred Binet et son oeuvre*, 1930; C. R. Stockard, *The Physical Basis of Personality*, 1931; F. Aveling, *Personality and Will*, 1931; M. B. Greenble, *Personality*, 1933; and V. M. Bechterev, *General Principles of Human Reflexology: the Objective Study of Personality*, 1933.

Personalty, synonymous with personal property (q.v.). The div. into realty and P. is traceable to a time when legal process was not sufficiently advanced to secure to a person wrongfully deprived of property other than freehold land its specific recovery as opposed to an action for damages against the person; but action to recover land was said to be a real action (Lat. *res*, thing), because the law issued process of execution against the thing demanded instead of putting the claimant off with damages.

Personation, see ELECTIONS.

Personification is the figurative endowment of things or qualities with human attributes, as in Milton's lines:

'Sport that wrinkled Care derides,  
And Laughter holding both his sides'

or Kipling's:

'If you can meet with Triumph and  
Disaster,  
And treat those two impostors just the

Expressions like 'the cruel sea' or 'a frowning sky' are sometimes described as personal metaphors (see METAPHOR). An extreme form of personification is the

pathetic fallacy (q.v.). See also FIGURE OF SPEECH.

Personnel Selection, see MENTAL TESTS. Persons, Robert, see PARSONS.

Perspective. The method of drawing by radial projection to show the apparent size and shape, or eye appearance of an object, is called linear P. It considers all points in a view as sending straight rays of light to the eye, the actual condition of things which produces the photograph in a camera. Since all lines converge to the eye, if 2 be drawn from the top and bottom of a telegraph post a 100 yds distant, smaller and smaller posts would fit the lines the nearer they approach the eye, and posts of the same size would overrun them, thus appearing larger, the distant post much smaller. Hence the great rule of P.: receding parallel lines converge to a point on the horizon, or eye level. 'Aerial' P. has no mathematical basis, and deals with the eye effect of brightness and colour and other accidents due to atmosphere. See W. L. Wyllie, *Nature's Laws and the Making of Pictures*, 1903; G. A. T. Middleton, *The Principles of Architectural Perspective*, 1903; R. V. Cole, *Perspective*, 1921; V. Cornish, *Scenery and the Sense of Sight*, 1935; F. Medworth, *Perspective*, 1936; and works by L. W. Miller (1887) and H. A. James (1888).

Perspiration, see DIAPHORETICS; SKIN.

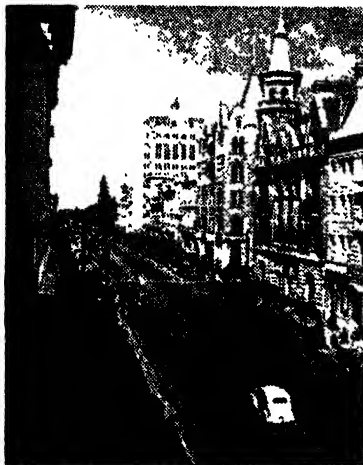
Persulphuric Acid or Perdisulphuric Acid ( $H_2S_2O_8$ ), acid formed at the anode by the union of the ions  $HSO_4$ , during the electrolysis of moderately strong sulphuric acid. The pure acid forms colourless crystals that are stable up to  $60^\circ C$ . It is dibasic, and its salts have the general formula  $M_2S_2O_8$ . The potassium salt is obtained by the electrolysis of a strong solution of potassium hydrogen sulphate. The persulphates are stable salts in the solid state, but aqueous solutions evolve oxygen and pass into sulphates. Both acid and salts are oxidising agents and give no reaction with barium chloride. Permonosulphuric acid or Caro's acid has the formula  $H_2SO_5$ , and is prepared by the action of sulphur trioxide upon anhydrous hydrogen peroxide:  $H_2O_2 + SO_3 = H_2SO_5$ . It forms white crystals melting at  $45^\circ C$ . and is a powerful oxidising agent. The acid finds commercial use in the dye industry.

Perth, James Eric Drummond, sixteenth Earl of (1876-1951), diplomat, b. Fulford, near York, and educ. at Bedford Grammar School and Eton. He entered the Foreign Office in 1900. Private secretary to under-secretary of state for foreign affairs, 1906-8 and 1908-10, he was the *précis*-writer to the foreign secretary, 1908 and 1910-11. One of Asquith's private secretaries, 1912-15, and private secretary to the foreign secretary, 1915-19, from 1919 to 1933 he was the first secretary-general to the League of Nations; Brit. ambas. to Italy, 1933-9; he was chief adviser on foreign publicity at the Ministry of Information, 1939-40. He became a Scottish representative peer in 1941. He succeeded to the earldom in 1937.

Perth: 1. City, royal burgh and co. tn



of Perthshire, Scotland, formerly called St Johnstoun, 43 m. NNW. of Edinburgh, beautifully situated on the banks of the R. Tay. The riv. is spanned by 2 fine bridges, and along its banks are 2 public parks known as the N. and S. Inches. Reputed to have been founded by Agricola in AD 70, it is believed to have been occupied by the Romans for 320 years. The oldest building of P. is the cruciform church of St John, of the 13th and 15th cents. The city was the scene of the murder of the Duke of Cornwall by his brother, Edward III of England (1336), and of the battle between the clans Quhele and Chattan described in Scott's *Fair Maid of Perth*. Here Knox preached his famous Reformation sermon. There are many manufs., distilleries, iron foundries, dye-works, glass-ware, and gaugo glasses. Pop. 40,800.



Australian News and Information Bureau  
ST GEORGE'S TERRACE, PERTH,  
AUSTRALIA

2. Cap. of W. Australia, on the Swan R., near its mouth, 12 m. NE. of the port of Fremantle. It has 2 cathedrals (Rom. Catholic and Anglican), a free univ., an observatory, a branch of the royal mint, and many substantial public edifices. There are many parks, racecourses, and sports grounds, etc., near by. Founded in 1829, it was created a municipality in 1856, and its more rapid growth commenced following the discovery of gold in 1893 at Kalgoorlie. Since then its expansion has been based on the export of primary products, such as wool, wheat, fruit, timber, dairy produce, and also gold. Pop. (with suburbs) 359,000.

3. Cap. of Lanark co., Ontario, Canada, on the R. Tay, 141 m. SW. of Montreal; it has manufs. of machinery, woollens, etc. Pop. 5060.

Perth Amboy, port of Middlesex co., New Jersey, U.S.A., at the mouth of the Raritan R. (bridged). It has an excellent harbour and manufs. bricks, terra-cotta, corks, drain pipes, and chemicals. Settled in 1683, and named after the Earl of Perth, it was the cap. of East Jersey 1686-1702, then alternate cap. Pop. 41,300.

Perthshire, inland co. of Scotland, bounded on the N. by Inverness-shire and Aberdeenshire, S. by Kinross, Clackmannan, and Stirling, E. by Fife and Angus, and W. by Argyll and Dunbartonshire. The co. includes such famous places as Scone, where the Scottish sovereigns were crowned (the Coronation Stone was removed to Westminster in 1296); Dunsinane, where Macbeth was defeated in 1054; and Killcrankie, scene of Dundee's great victory in 1689. There are many remains of prehistoric stone circles and standing stones, and sev. Rom. sites of great interest, notably at Ardoch near Braco. Dunkeld Cathedral was founded in 1107, and Dunblane Cathedral in 1240. P. is partly highland and partly lowland; in the N. are the Grampians (q.v.), amongst the highest elevations being Ben Lawers (3984 ft) and Ben More (3843 ft), while in the S. are the Ochil and the Sidlaw Hills. The prin. rivs. are the Tay (the longest riv. in Scotland), the Earn, and the Forth. Lakes are numerous, and include Lochs Tay, Earn, and Katrine. The scenery of the Trossachs (q.v.), wild and picturesque, has been immortalised in Scott's *The Lady of the Lake*. Large areas of the co. are uncultivated, but are given over to sheep and cattle rearing, and afforestation. In the lowland portions of the co. agriculture flourishes. Woollen and tartan materials, cotton goods, and linen are manufactured, and the Tay salmon fisheries are important. In recent years hydro-electricity has been greatly developed. Perth (q.v.) is the co. tn. and among the small burghs are Blairgowrie and Rattray (joint burgh), Crieff, and Pitlochry. P. and Kinross constituency forms 2 parl. divs., each returning 1 member. Area 2494 sq. m.; pop. 128,000. See T. H. Marshall, *History of Perthshire*, 1849.

Pertinax, Helvius, Rom. emperor from 1 Jan. to 28 Mar., AD 193, was reluctantly persuaded to accept the purple on the death of Commodus. But having attempted to check the licence of praetorian troops, he was slain by the latter, who then put up the empire for sale.

Perturbations, deviations from the main mathematical orbits of motion of the heavenly bodies due to smaller or irregular attractions. A periodic perturbation is an inequality produced in the orbit due to the temporary nearness of an attracting body. The solar system having a settled 'average system' of orbits with calculable disarrangements due to alteration of relative positions, periodic P. are temporary disturbances which pass and recur. They are of very great use in determining mass, density, and distance. Secular P. are changes in the elements of

orbits (see ORBIT), which continue in the same direction for centuries; they are themselves periodic in long cycles of scores of thousands or hundreds of thousands of years. One of sev. important secular P. is the alternate increase and decrease in the eccentricity of the earth's orbit; at the beginning of 1955 its value was 0.0167280, and it decreases by 0.0000004 each year, so that the earth's orbit is slowly becoming more circular. This decrease will continue for 24,000 years but will not reach zero, and then will begin to increase. Although Lagrange and Laplace found that P. in the solar system are oscillatory so that our system is stable, Poincaré's work suggested that this need not necessarily be true. While this question cannot be decided at present, it is possible that in an immensely long period of time the present conditions may not be preserved, and some of the planets may gradually disappear from the sun's attraction, while others may be drawn in by and finally fall into the sun. Lunar P. are of particular importance to us; they are: (1) effect on the length of the month; (2) the revolution of the line of apses; (3) the regression of the nodes; (4) the evection; (5) the variation; (6) the ann. equation; (7) the secular acceleration of the moon's mean motion; besides many others, theoretically infinite, but about 70 of importance.

Pertwee, Roland (1885- ), playwright, b. Brighton. He studied art, but later became an actor and then a writer. His plays are his most serious work, the most successful being *Interference*, 1927, in which he collaborated with H. Dearden. Others are *Seen' Reason*, 1913, *Swank*, 1914, *The Return of Imry*, 1914, *Falling Upstairs*, 1914, *Early Birds*, 1916, *Ten Minutes Tension*, 1917, *Hell's Loose*, 1929, *Pursuit*, 1930, *Pink String and Sealing Wax*, 1943, and *School for Spinners*, 1947. He has also written sev. novels, and an autobiography, *Master of None*, 1940.

Peru, republic of S. America, bounded on the W. by the Pacific Ocean, N. by Ecuador and Colombia, E. by Brazil and Bolivia, S. by Chile. It includes the basin of the Ucayali, with a large portion of the basin of the Marañón or Amazon as far as the Javari trib. The Pacific coast rises steeply for 150 m. inland to the plateaux (which vary between 6000 and 12,000 ft.) and ranges of the Andes. Area 514,059 sq. m. Pop. (1950, estimated) 7,800,000 (exclusive of the pop. of forests, which is estimated at 500,000). Of the total pop. half were of European origin and nearly half Indian, the remainder Asiatics (c. 40,000) and Negroes (c. 30,000). Lima, the cap., had a pop. of 835,500. Other tns are Callao, Arequipa, Cuzco, Iquitos, Chiclayo, Trujillo, Chinchua, Ica, Sullana, Cerro de Pasco, Huancayo, Huaraz, Ayacucho, and Piura. The area of the republic was long a matter of uncertainty owing to boundary disputes with Chile and Bolivia. Since 1883 Chile had retained the provs. of Arica and Tacna, and all attempts at settling the dispute had failed. In 1929 Tacna was returned to P. and Arica was kept by Chile, but P.

received 6,000,000 Amer. dollars' compensation, and some 6 sq. m. in the neighbourhood of the port of Arica were also ceded.

NATURAL DIVISIONS. P. falls naturally into 3 clearly defined and diverse regions: (1) The coastal strip, between the Pacific and the Maritime Cordillera, a sandy desert intersected by fertile valleys and now itself largely made fertile by irrigation. It is about 80 m. wide, and produces sugar and many other crops. (2) The vast triple chain of the Andes, 250 m. wide, with its great plateaux, and rich valleys, grazing land, coffee plantations, and mineral wealth. (3) The Montaña of the E. Andean slope, with its tropical forests and rivers, but little explored. Of the total arable area of 29,500,000 ac., only 3,600,000 are under active cultivation. In the arid coast region the gov. has brought under irrigation over 60,000 ac. during the last few years, and more is envisaged—e.g. around Trujillo.

CLIMATE AND RACE. P. is in the lats. of the SE. trades, which blow in warm and moisture-laden off the Atlantic, precipitate some of their rain in passing over the pampas, but discharge the body of it on the E. slopes of the Andes, and descend cold and dry on the W. side. Hence there is little or no rainfall on the coastal strip of P. On the Pacific near shore the prevailing wind is parallel to the coast or away from it. In Lima the extreme summer maximum temp. is 82°, winter minimum 56°, the corresponding means being 68° and 59°; but the city climate is made depressing by frequent formation of a cloud-cap. The Puna is cold, the lower Montaña is typically tropical, but the higher region is delightful. Light malaria, *paludism*, is common, but yellow fever and plague are rare. The people of pure Sp. blood are not numerous, having so intermingled with the Indians that they are now mestizos or people of mixed race, but their language is Sp., and the higher classes have much culture. Negroes and Asiatics together form about 1 per cent of the pop. The bulk of the pop. of the uplands, who are known as Cholos, are descended from the original Quechuas and Aymaras of the Inca Empire. They are strong and hardy, and make excellent miners, and the greater part of the work of the country is done by them. Many of them are small peasant proprietors.

OCCUPATIONS, PRODUCTION, AND COMMERCE. About 80 per cent of the pop. is dependent on agriculture, mainly with the help of irrigation. The chief agric. products are, in the order named, cotton, sugar, wool, hides, skins, coffee, and rice. In the coast region sugar, cotton, maize, alfalfa, and various fruits are grown. Peruvian cotton is of very high quality. Here also is the more modern and energetic life of the country. Callao, Chimbote, and Paita have good harbours, Chimbote being a port and processing centre for minerals, Paita for cotton. The Lobitos oilfields have a commercial outlet at Tumbes, and Salaverry is the port of Trujillo and the sugar dist. A new port

has been developed at Matarani. The forests of the dept. of Loreto have plantations of the coco shrub, and in this remote place the sugar-cane, cotton, coffee, grapes, figs, oranges, pineapples, and bananas grow abundantly, but trade is hampered by lack of transport. Molendo, one of the worst ports, is the outlet for Arequipa, the Títicaca dist., and the Montaña. Huancavelica is the centre of the quicksilver mines. The uplands are the home of the potato. Lake Títicaca (q.v.), with Lake Poopó and the R. Desaguadero, is a good waterway. Coffee is produced chiefly in Chanchamayo, Perené, and Paucartambo. Cocoa is extending in Perené. Coca is chiefly grown in Otuzco for the Indian pop., and cocaine is manufactured in Lima, Callao, and Utuzco, chiefly for export. Dyes, cinchona, and other medical plants are found; alpaca, sheep, and llama wool is exported. Rubber is shipped from Iquitos on the Amazon. The gathering of wild rubber, once the most important industry in the Amazon region, was stimulated under pressure from the U.S. Gov., which agreed to take all surplus rubber for 5 years from 1942. Copper and petroleum (which is nationalised) are the chief minerals exploited. The chief copper mine is at Cerro de Pasco, the highest in the world at an elevation of over 14,000 ft. It has been operated for 3 centuries. P. is one of the world's largest sources of vanadium. Other minerals exported include antimony, lead, tungsten, and bismuth. Gold is widely found, but transport and labour difficulties hinder mining. There are large iron deposits.

In 1947 the imports were valued at 1,091,957,000 soles, and the exports at 1,002,943,000 soles (the gold sol was until 14 Nov. 1949 worth 47.50 cents (U.S.A.), or 17.38 to the £ (i.e. 1s. 1d.). This was the first unfavourable trade balance in Peruvian hist. In 1956 the trading figures amounted to 6,934,473,000 and 5,917,262,000 soles respectively. The exchange rate is now 64 to the \$. Imports are cotton and woollen goods, electrical goods, arms and munitions, dyes, machinery, etc. Exports include cottons, hides, copper bars, petroleum, sugar, wool, mineral concentrates, and precious metals. In 1954 P. exported to the U.K. goods valued at £14,338,000, and U.K. imports to P. were valued at £6,542,000. In 1955 the estimated revenue and expenditure of P. balanced at 3,885,500,000 soles. The total debt of P. (1953) amounted to 1,592,830,000 soles, of which the internal debt was 889,271,000. Brit. investments in 1953 amounted to £21 m., yielding £600,000. Amer. direct investments in 1950 were \$140 m. Amer. holdings of Peruvian dollar bonds in 1953 were \$76,232,000.

COMMUNICATIONS. There are about 24,061 m. of roads suitable for motor traffic. The central highway over the Andes was completed in 1935; the rich E. part of P. was made accessible by the Callao-Huánuco-Pucallpa highway, opened in 1943; Lima was linked with Iquitos by the Lima-Pucallpa highway,

completed in 1944. There are good railways, which are carried to remarkable heights, Cerro de Pasco being served by a broad-gauge railway. P. has 2350 m. of railway. Since 1942 the administration of posts, telegraphs, and wireless service has been in the hands of the gov. There are 6 gov. and over 50 other radio stations. Private stations were suspended in 1942. Air mail and passenger services are fully developed.

GOVERNMENT. P. is governed by a president, who is elected for a term of 6 years, a senate of 42 members, and a chamber of deputies of 149 members, one-third renewable at general elections every 2 years. Voting is compulsory for all adult literate nationals. Women gained full franchise in 1955. The executive power is vested in the president. Under the constitution of 1933, as amended in 1939, he is advised by an economic advisory council of specialists in various fields. The president exercises his executive functions through a cabinet holding office at his pleasure. The 24 depts of P. are divided into 124 provs., each dept being administered by a prefect and each prov. by a sub-prefect. Dr Manuel Prado was elected new Constitutional President after the elections of 17 June 1956.

JUSTICE. There is a supreme court at Lima composed of 11 judges and 5 fiscals, and 19 superior courts. The judges of the supreme court are chosen by Congress from lists of names presented by the gov.; those of the superior courts and of the minor courts by the gov. from lists of names presented by the supreme and superior courts respectively.

DEFENCE. Military service is compulsory and universal, but, ordinarily, only a limited number of the yearly quota of conscripts is called up for active duty with the colours. The term of service is 2 years in the active army, 10 years in the reserve, and 20 years in the National Guard. The authorised estab. of the army in 1940 was 2000 officers and about 30,000 other ranks. Aviation, civil and military, is controlled by the Ministry of Marine and Aviation. The U.S. Gov. sent 50 aeroplanes on Lease-Lend terms in 1942. The Peruvian Navy includes 2 obsolete cruisers (1906) of 3200 tons with 6-in. guns, 2 destroyers, 5 submarines, and 8 riv. gunboats. There is a naval cadet school near Callao and a submarine base on San Lorenzo Is., opposite Callao.

EDUCATION, LITERATURE, AND RELIGION. Education is well run in P. and is free and compulsory. The system is highly centralised. In 1952 there were 12,190 elementary schools, and 104 secondary state schools giving 5-year courses. About 150 secondary schools were conducted by religious orders and other bodies. There are also rural schools for Indians, commercial and industrial schools, etc. Besides 2 excellent univs. at Lima, there are 3 others, at Arequipa, Cuzco, and Trujillo. Few of the S. Amer. reps. equal P. in culture and literature. Felipe Pardo y Aliaga (d. 1868) was a brilliant man of letters and the author of sev.

sparkling comedies. Manuel A. Segura (d. 1871) was also a distinguished dramatist. Among many poets Pedro Paz Soldán y Unanue (d. 1895) was the chief in the 19th cent. Ricardo Palma (1833-1919) was an important writer of Peruvian hist.; José Santos Chocano (c. 1875-1934) was in his day perhaps the most powerful of all Sp.-Amer. poets. Religious liberty exists, but the Rom. Catholic faith is protected by the State. A decree of 1929 allowed only Rom. Catholic religious instruction in schools. There is a Rom. Catholic archbishopric at Lima, dating from 1545, and 18 bishops and vicars-general.

**HISTORY.** P. was conquered (1531-41) by Francisco Pizarro, and remained under Sp. rule till 1821. The country enjoyed an uneventful and prosperous hist. Lima was the centre of Sp. viceregal rule and trade, and in every respect the chief city of the New World. Here, in 1551, was founded the univ. of San Marcos, the first on the Amer. continent. From early times Jesuit missionaries were at work, spreading culture and enlightenment. The War of Independence lasted some 3 years, and the Spaniards were finally defeated at Ayacucho (1824). When P. became independent, for a long time its record was one of perpetual civil strife. By the middle of the century prosperity was being estab., but it was shattered by a disastrous war with Chile (1879-83). The nitrate fields of Tarapacá, which were the main subject of dispute, were lost, and Arica and Tacna were also retained by the victors; as shown above, that matter was afterwards settled. Financially P. was ruined, and in 1890 the Peruvian Corporation took over the foreign debt in return for a 66 years' lease of railways and many other valuable concessions. Boundary disputes between S. Amer. states are, however, a frequent source of armed conflict, and in 1932 Peruvian filibusters from Iquitos occupied Leticia on the Colombian frontier, demanding a revision of the treaty settlement ratified by P. in 1927. The Peruvian Gov. supported the filibusters and broke off diplomatic relations with Colombia. The League of Nations, on Colombia's appeal, pronounced against P.; after a few months' skirmishing and bombing, a League commission was appointed to administer Leticia, until a settlement was reached between the 2 countries at Río de Janeiro in 1934. In 1939, 88 per cent of the electorate approved amendments to the constitution of 1933 by which proportional representation was abolished and general elections replaced by a renewal of one-third of the chamber biennially. In 1941 fighting took place between Peruvian and Ecuadorian troops for some weeks over a boundary dispute respecting the region N. of the Marañón from the Pongo de Manseriche, which, however, was settled. P. broke off diplomatic relations with the Axis powers on 24 Jan. 1942, and the U.S. Gov. made a loan to P. of \$20m. for defence purposes. A trade treaty was also concluded with the U.S.A. for the

disposal of Peruvian cotton and rubber surpluses. P. declared war on Germany and Japan in Feb. 1945. Though taking no active part in the war, the country supplied valuable raw materials to the Allies. P. became a foundation member of the United Nations.

**ANCIENT CIVILISATION.** Archaeological remains of the country take us to much earlier forms of culture than those of the Inca. Geographically P. can be divided into 3 zones, the Coast, the Sierra, and the Montaña. The most discussed problem of Peruvian archaeology is whether the cultural priority goes to the prehistoric culture of the Sierra or to that of the Coast zone. According to J. C. Tello, the priority is to be given to the 'autochthonous' people of the Sierra, to the culture of Early Tiahuanaco and Chavin. According to him, archaeological traces of the Chavin culture may also be found at Lambayeque, Ancón, and Paracas. On the other hand, M. Uhle distinguishes the following 5 phases of pre-historic Peruvian cultures, of which the first 3 are in the Coast zone: (1) S. valleys: Early Nasca or Nasca I and the 2 Inca (q.v.) periods; (2) central valleys: Proto-Lima (Nieveria) and Recuay; (3) N. valleys: Early Chimu or Chimu I (Trujillo) and Late Chimu or Chimu II (Chanchnán); (4) the Sierra, with the cultures of Chavin and Tiahuanaco I, followed by Tiahuanaco II; and (5) the Inca or Cuzco culture. The chronological problems are still open. Uhle dates the Coast cultures from AD 700, the Sierra culture from 500 to 1000, and the Inca culture, in its zenith, from 1300 to 1500. According to other scholars (e.g. E. Seler), the 2 cultural groups (Coast zone and the Sierra) were roughly contemporaneous. The Inca Empire fl. from the first Inca, Manco Capac (Capac) (about AD 1000), till Pizarro's arrival and the defeat and death of Atahualpa in 1532. It extended over P., Bolivia, and Ecuador, and its influence extended even to the Gran Chaco. The cap. was at Cuzco (q.v.), and Quito was another important centre. A complete system of roads was estab. It is their buildings which make the Incas chiefly worthy of admiration, of which the most remarkable are at and around Cuzco, including the great fortress of Sacasahuaman, the Temple of the Sun, the palaces of Huayna Capac and of Pachacuti. The ruins of Machu Picchu (q.v.) are of great beauty. and it is believed that the city was the traditional Tampu-tocco, cradle of the Incas. A road was opened in 1948 by which access to the site is gained. The ruins consist mainly of most remarkable monoliths, some nearly 20 ft high, which were fitted into their place by workmen who knew no mechanical contrivance and used no mortar. The Incas had great proficiency in astronomy, as we find from the remains of their observatories. Bronze and copper cutting tools were used, but iron was unknown. Skilled and beautiful metal work in gold and silver, pottery, and textile fabrics have been preserved.

**Religion.** There are temples of the sun and moon; their 'unknown God,' a supreme spirit, all-pervading, was worshipped without idols or human sacrifices. The image of the Creator was represented at Cuzco by a large flat plate of fine gold, of an oval or elliptical form. The sacred fire of the sun was attended by vestal virgins. Manco Capac, the first legendary Inca, was, according to legend, born of a virgin and came as a redeemer of mankind and a teacher of civilisation.

**Agriculture** was advanced, and the system of terrace culture was admirably adapted to the mts. Land was held on a communal system, one part being reserved for the sun temples and priests, another for the Inca, and a third for the people. Each Indian was given a measure of land, and, as soon as he had a family, a further allowance was given to each member. Idleness was punished. Poverty and destitution were unknown, the old and infirm being cared for by their neighbours.

The Inca Gov. estab. storehouses as a precaution against famine and to secure that the common produce of the people's labour should be equitably distributed. In all respects, as far as we know it, the social and political system was admirable. The gov. was a benevolent despotism, interfering with the lives of its subjects at every turn with sumptuary laws and all manner of regulations in the minutest matters of daily life, and such a system was well suited to the docile nature of the people. Conquered peoples were well treated and induced to join in the Incan system. Garcilasso, the Sp. chronicler to whom we are indebted for the greater part of our knowledge of the Inca regime, declares that no anc. kings, whether of Asia, Africa, or Europe, have ever shown such wise and benevolent treatment of their subjects.

See F. P. Martin, *Peru of the Twentieth Century*, 1911; W. H. Prescott, *The Conquest of Peru*, 1847, 1905; Sir Clements Markham, *Peru*, 1881, *The War between Peru and Chile*, 1883, *A History of Peru*, 1892, and *The Incas of Peru*, 1910; C. R. Enock, *Secret of the Pacific*, 1908, and *Peru*, 1908; G. Guinness, *Peru: its Story, People and Religion*, 1909; E. C. Vivian, *Peru*, 1914; W. M. McGovern, *Jungle Paths and Inca Ruins*, 1928; P. A. Means, *Ancient Civilisations of the Andes*, 1931, and *Fall of the Inca Empire and the Spanish Rule in Peru, 1530-1780*, 1932; J. Basadre, *History of Peru*, 1938; J. Valera, *History of Peru* (Lima), 1938; A. M. Renwick, *Wanderings in the Peruvian Andes*, 1939; C. Sandeman, *A Wanderer in Inca Land*, 1948; G. H. Bushnell, *Peru*, 1957.

**Peru Balsam**, see BALSAM.

**Perugia:** 1. Prov. of Italy, in N. Umbria (q.v.). It is in the Central Apennines (q.v.), and from the centre of the prov. the broad and fertile valleys of the Tiber (q.v.) and the Tevere run respectively SW. and SE. In the W. is Lake Trasimene (q.v.). Cereals, wine, oil, and fruit are produced, and coal and iron are found. The prin. tns include P., Foligno, and

Assisi (qq.v.). Area 2,445 sq. m. Pop. 588,000.

2. (anc. Perusia) It. city, cap. of the prov. of P., and chief tn. of Umbria, built on a hill commanding the Tiber valley, 80 m. N. by W. of Rome (q.v.). Originally an Etruscan city (see ETRURIA), it was taken by the Romans in 40 BC and by Totila (q.v.) in the 6th cent. In the Middle Ages it was frequently devastated in wars with neighbouring tns. It came under the rule of the popes in 1534 (see CHURCH, STATES OF THE). There is a 14th-15th-cent. archiepiscopal Gothic cathedral. The old exchange, the *Collegio del Cambio*, and the *Palazzo Comunale* contain many notable works of art, including frescoes by Perugino (q.v.) and his school. The univ. dates from 1200. There are considerable Etruscan remains in the neighbourhood. Textiles, chemicals, lace, and machinery are manuf., and there is a large trade in agric. produce, wine, and oil. Pop. (tn) 38,100; (com.) 96,900. See W. Heywood, *History of Perugia*, 1910, and M. Symonds and L. Duff-Gordon, *Perugia*, 1898 (Medieval Towns Series).

**Perugia, Lake**, see TRASIMENE, LAKE.

**Perugino, Pietro**, properly Pietro Vannucci (?1446-1523), It. painter, one of the masters of the Umbrian school, b. Città della Pieve, near Perugia. He is said to have been a pupil of Lorenzo di Lorenzo and probably an assistant to Verrocchio. His first public work was the execution of the frescoes in the Palazzo Comunale in Perugia (1475). In 1480 he was one of the group of artists chosen by Sixtus IV to embellish his newly finished Sistine chapel, and painted the 'Delivery of the Keys to St Peter,' a work which particularly shows his method of bringing out in accurate perspective, and with true feeling of the value of distance, the effects of space and atmosphere, a method which his pupil Raphael (q.v.) carried to perfection. P. led a wandering life: in 1449 he painted the noble frescoes in the Collegio del Cambio of Perugia, but after 1502 he worked mostly at Florence. His 'Virgin and Child, with Sts Michael and Raphael,' and 4 other works are in the National Gallery. See lives by G. C. Williamson, 1900, and F. Canuti, 1931.

**Perusia**, see PERUGIA.

**Peruvian Bark**, or **Jesuit's Bark**, bark of various trees of the genus *Cinchona*. See CINCHONA; CINCHONA BARK ALKALOIDS.

**Peruweltz**, tn in the prov. of Hainaut, Belgium, 12 m. SE. of Tournai, near the Fr. border. It is engaged in manufs. of leather, ropes, knitted goods, and footwear. Pop. 7800.

**Peruzzi, Baldassare** (1481-1536), It. architect and painter, b. near Siena. His early work was in imitation of Pintoricchio (q.v.), but later he was influenced by Raphael. In 1509 he designed the Villa Farnesina in Rome, for which Raphael painted the frescoes. In 1520 he was appointed architect of St Peter's, in succession to Raphael, and may have designed the Orsini, Lante, and Orsoli palaces at Rome; as well as the Albergo Palace at Bologna. Among his paintings

at Siena is the famous 'Augustus and the Sibyl,' in the church of Pontegiusta. Becoming city architect at Siena on the sack of Rome in 1527, in 1532 he returned to Rome, where he built the Vidoni and Orsini palaces, and his architectural masterpiece, the Massimi Palace. See biographies by A. Donati, 1879, and W. Kent, 1925.

**Pesaro** (anc. *Pisaurum*), It. tn and bathing resort, cap. of the prov. of P. e Urbino (q.v.), 37 m. NW. of Ancona (q.v.). It is on the Adriatic coast, at the mouth of the R. Foglia. There was severe damage during the Second World War. P. has a 15th-cent. ducal palace, a cathedral, and a musical lyceum, founded by Rossini (q.v.), who was b. here. There are silk, engineering, majolica, and sugar industries, and a trade in figs, wine, oil, cheese, and wax. Pop. (tn) 28,900; (com.) 56,300.

**Pesaro e Urbino**, prov. of Italy, in the N. Marches (q.v.). It is generally mountainous and contains some high ridges of the Apennines (q.v.), but has a wide, undulating coastal plain on the Adriatic in the E. The chief rvs. are the Metauro (q.v.), Foglia, and Cesano. Cereals, fruit, wine, and silk are produced, and iron is found. The prin. tns include Pesaro, Urbino, Fano, and Fossombrone (qq.v.). Area 1117 sq. m. Pop. 334,000.

**Pescadores**, or **P'enghu**, group of about 12 basaltic is., off the W. coast of Formosa, China Sea. They were ceded by China to Japan in 1895, and returned to China in 1945. Since 1949 they have been occupied by Chiang Kai-shek's refugee gov. in Formosa. Millet and rice are grown and there are good fisheries. Area 50 sq. m. Pop. about 70,000. See FORMOSA.

**Pescara**, **Fernando Francesco d'Avalos**, Marquis of C. 1489-1525, Neapolitan gen. in the service of Spain. At the battle of Ravenna (1512) he was taken prisoner by the French, but was soon ransomed; he served in the war in Lombardy (1515) and was severely wounded at Pavia (1525). He was placed in command of the army of Italy, and was approached by Morone to join the Duke of Milan's party in a plot against Charles V. P., however, betrayed the conspiracy to Charles.

**Pescara**: 1. Prov. of Italy, in E. Abruzzi e Molise (q.v.). It is mainly mountainous, and has high peaks of the Central Apennines (q.v.) in the S. There is a short coastal plain on the Adriatic, and there are fertile riv. valleys; the chief rvs. are the Tavo and the P. Area 475 sq. m. Pop. 246,000.

2. It. tn and bathing resort, cap. of the prov. of P., on the Adriatic, 42 m. ENE. of L'Aquila (q.v.). It is a modern tn divided into 2 parts (P. proper, and Castellamare Adriatico) by the P. riv. Pop. (tn) 56,900; (prov.) 64,000.

3. Riv. of Italy, rising in the Central Apennines and flowing generally NE. across Abruzzi e Molise to the Adriatic at P. On 5 May, 1944, during the Second World War, R.A.F. dive bombers smashed the great P. dam, 12 m. SW. of Chieti (q.v.), thus putting out of action

the hydro-electric works which supplied current to the railways of a great part of Central Italy. Length 40 m.

**Pesohiera**, It. fort. tn, in Veneto (q.v.) at the SE. corner of the Lake of Garda (q.v.). Pop. 2500.

**Pescia**, It. tn, in Tuscany (q.v.), 11 m. ESE. of Pistoia (q.v.). It has a 14th-cent. cathedral and an anc. castle. Textiles, oil, hats, and paper are manuf. Pop. (tn) 10,200; (com.) 20,500.

**Peseta**, silver coin, the standard unit of currency in Spain, containing 100 centesimos; coins and notes of different values are issued.

**Peshawar**, city of W. Pakistan, formerly cap. of NW. Frontier Province. P. stands close to the foot of the Khyber Pass into Afghanistan, and has for centuries been a centre of the transit trade between the Indian sub-continent, Afghanistan, and Central Asia. The bazaars do a brisk trade and are thronged with tribesmen from distant places. It is an old city, and was once a Buddhist centre with a huge *stupa*, now in ruins. Having been in Muslim occupation since about AD 1000, it was taken by the Sikhs in 1833 and by the British in 1849. The Islamic College, instituted in 1915, has now become the Peshawar Univ. The country immediately around P. is noted for the excellent fruit grown, including apples, peaches, and pears.

**Peshkov**, see GOR'KIV.

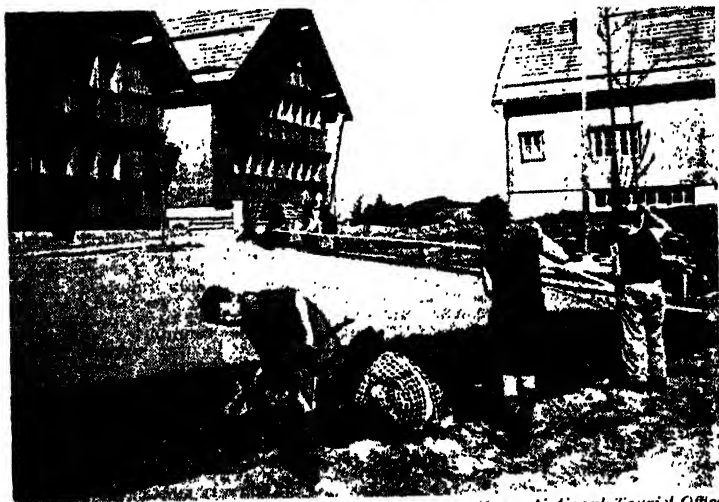
**Peshwa**, or **Peishwa**, anc. head of the Mahrattas (q.v.). The title was annulled by the British in 1818, owing to the continued hostility of the Mahrattas, and their ter. was annexed.

**Peso**, name of the monetary unit of sev. Lat. Amer. countries, Paraguay, Colombia, Mexico, the Argentine, etc. It is usually divided into 100 centavos. Following Brit. devaluation of sterling in 1949, the Argentine Gov. readjusted the exchange rate of the P. in relation to the £ from 13.53 to 9.40. See also METROLOGY.

**Pessimism**, attitude of mind, which, confronted by the prevailing irrationality, misery, and worthlessness of life, despairs of finding any real happiness, dignity, purpose, or beauty therein. Often the world-weariness expressed by, for example, Homer and Sophocles, is in fact but a transient subjective mood. Usually, as for instance in the Heb. Koheleth, in the Gospel, and in some forms of Pantheism (e.g. Brahmanism), the sense of frustration is transcended by a loftier estimate, and it is seen that 'God will bring every work and secret thing . . . into judgment.' When this view is not taken P. results. P. finds its earliest systematic development in Buddhism wherein consciousness can convey only suffering. The existence not only of a supreme Goodness but also of a supreme absolute Being is denied, and the only refuge offered is that of self-alienation from all desire, hope, and aesthetic sentiment. In this final comatose indifference, when one has realised the vanity and futile nothingness of life, and has overcome susceptibilities to all emotional stimuli, Buddhism finds the

greatest expression of human wisdom; it is praiseworthy because it anticipates death, the great relief from all wretchedness. Buddhism is thus the origin of all modern European P. Epicureanism is closely related to Buddhism, since it regards happiness as accidental in life, existing as a temporary negation of sorrow rather than as a positive emotional or rational circumstance. P. appears in the W. with David Hume's *Treatise of Human Nature and Discourse*; but its chief modern exponents are Schopenhauer (q.v.) and von Hartmann (q.v.). The P. of Nietzsche (q.v.) is only incidental to his opti-

by winning a national literary prize. He wrote at first in English (*Antinous*, 1918; *35 Sonnets*, 1918; *English Poems*, 1921) and then pub. a large number of poems in short-lived literary periodicals under his own and 3 different names (Alberto Caeiro, Ricardo Reis, Avaro de Campos), which we might call pseudonyms, but which he believed to correspond to distinct aspects of his personality. He contrives to render the conflict of the poet's inner world in all its facets; the squalor of existence, the frustrated quest for the absolute, the corrosive influence of time, and a pagan lust for life are recurrent



Swiss National Tourist Office

PESTALOZZI CHILDREN'S VILLAGE AT TROGEN

mistic ideal of the Superman. Schopenhauer perceives in life only a blind will, an irresponsible and ungrudged force, which works heedlessly in all directions, and so causes the incongruities, the irreconcilable conflicting impulses of which existence consists. He advocates suicide and deprecates love as helping to propitiate misery. Von Hartmann prefers the expedient of continuing as things are until mankind has been educated to perceive the significance of oblivion and to take the necessary action. See also STOICS. See J. Sully, *Pessimism, a History and a Criticism*, 1877; E. M. Caro, *Le Pessimisme au 19<sup>ème</sup> siècle*, 1878; H. Oldenburg, *Buddha* (trans.), 1882; A. Schopenhauer, *Die Welt als Wille und Vorstellung*, 1883-6; C. R. E. von Hartmann, *Philosophie des Unbewussten*, 1884; and H. Diels, *Der antike Pessimismus*, 1921.

Pessoa, Fernando (1888-1935), Portuguese poet, probably the greatest since Camões (q.v.), b. Lisbon and educ. in S. Africa, where he distinguished himself

themes in his poetry, where the emotional element is always superseded by the intellectual. See *Collected Works*, 1951-5; J. G. Simoes, *Vida e obra de F. Pessoa*, 1951.

Pest, see BUDAPEST.

Pestalozzi, Johann Heinrich (1746-1827), Swiss educational reformer, b. Zürich. He studied theology, law, and scientific agriculture, not putting his educational views into practice until he was of middle age. In his attempt to educate his own child 'according to Nature' after the manner of Rousseau's *Emile*, P. discovered the value of the fundamental principles of his master while rejecting his extravagances. In 1775 he gathered together a number of destitute children, to whom he proposed applying his theories; the scheme proved a financial failure, but when adapted in 1798 to an orphan asylum at Stans, in 1799 at Burgdorf, and in 1805-25 to the institute which he founded at Yverdon (Neuchâtel), his ideas were spread through

the various foreign teachers who came to him and influenced the whole course of modern education. He wrote *Abendstunde eines Einsiedlers*, 1780; *Lienhardt und Gertrud*, 1781; and *Wie Gertrud ihre Kinder lehrt*, 1801. See also EDUCATION. See works on P. by Krüsi, 1875, G. Seyffarth, 1881, De Guimps, 1889, and Pinloche, 1901; also the book compiled in Switzerland under an official committee on the centenary of P.'s death, trans. into Eng., 1928, as *Pestalozzi and His Times*.

**Pestalozzi Children's Village**, new vil. in the canton of Appenzell, Switzerland, named after Johann Heinrich Pestalozzi (q.v.), the Swiss educational pioneer. It was founded in 1946 for war refugee children from various countries. The children live in pleasant modern houses, and the groups are educ. by the teachers of their respective nationalities. In 1956 Hungarian refugees were accepted. There are plans for a similar vil. in the Chiltern Hills in England.

**Pestilence**, see BLACK DEATH; CHOLERA; EPIDEMIC; PLAQUE; SMALLPOX; SWEATING SICKNESS; TYPHUS FEVER.

**Pesto**, see PAESTUM.

**Pests, insect**, see INSECTOIDES; INSECT.

**Petacci, Clara**, see MUSSOLINI.

**Pétain, Henri Philippe Benoni Omer Joseph** (1856-1951), Fr. soldier and statesman, b. Cauchy-la-Tour (Pas-de-Calais). Educ. at St Cyr, 1876-8, he became a lieutenant in the Alpine Chasseurs, and later a captain attached to the general staff of the 15th Corps at Marseilles. He was successively military governor of Paris, instructor at the École Normale de Tir at Châlons, 1902, and assistant-instructor at the School of War, 1906. Although his fame as instructor was great, he was not made colonel till 1912, when he was placed at the head of the 33rd Infantry at Arras. At the opening of the First World War he was made a temporary brig. gen. commanding the 4th Brigade, part of the 1st Army Corps. After being in the retreat from Belgium, 1914, P. was placed in command of the 6th Div., which fought at the Marne, and was soon afterwards in command of the 33rd Army Corps, which covered Arras. In 1916 Joffre placed him in command of the army formed to relieve Verdun. P. soon fulfilled the promise with which his name was to be associated for the next quarter of a century: 'Ils ne passeront pas!' Before the middle of Mar. the Ger. advance was decisively checked. In April P. surrendered this command to Nivelle, and took command of the armies of the centre. In May 1917 he became commander of the armies in the N. and NE. In July 1918, the supreme command of British and French being now vested in Foch, P. was entrusted with the general attack by all Fr. forces. Marshal, 19 Nov., 1918, P. became a member of the Academy, 1929. Vice-president, Council of War 1920-30, was on Council of National Defence from 1931, and war minister in Doumergue's Gov., 1934. After the Sp. civil war he became Fr. ambas. to Spain. In May 1940 Reynaud called him

into his cabinet as vice-premier, but by this time P. had become convinced that Ger. victory was inevitable, and was soon urging an immediate Fr. capitulation in order to secure the most favourable possible terms for France, rather than fight on to total collapse. On 16 June he formed a cabinet, and asked Hitler for an armistice, but it was not until 25 June that he told the Fr. people of its humiliating terms. After this he became 'chief of the Fr. state', abolished the republican constitution, and substituted a dictatorial system of gov. for that part of France which remained unoccupied until the allied landings in N. Africa towards the end of 1942. His real authority was never great, however, Laval and the Germans being the controlling force. Though by the end of the war P.'s name was spoken of with detestation by the great majority of Frenchmen, it is clear that between 1940 and 1942 many people in Vichy France believed that he had saved them from a considerably worse fate by his action in treating with the Germans. After 1942 P.'s position as head of the state was more nominal than ever, all effective authority having passed to Laval and Admiral Darlan. He had retired from the active political scene by the end of 1943. When the allied invasion of Europe began he appealed to Frenchmen to remain quiescent. Under Ger. threats P. left Vichy and was taken to Belfort and later to Sigmaringen. In April 1945 he voluntarily returned to France, where he was arrested and interned. On a charge of treason he was tried and sentenced to death, this being commuted to life imprisonment. He was taken to the Isle d'Yeu, off the Vendian coast, where he d. He protested at his trial (and there seems little reason to doubt his sincerity) that his conduct had been actuated by his desire to serve his country in the way he believed best for it; on sentence he declared: 'The French people will not forget. They know that I defended them as I did at Verdun.' See G. Suarez, *Le Maréchal Pétain, 1914-40*, 1940; P. L. Michel, *Le Procès Pétain*, 1945; A. Fabre-Luce, *Le Mythe Pétain*, 1946; P. Farmer, *Vichy Political Dilemma*, 1955; H. Lüthy, *The State of France* (Eng. trans.), 1955; and A. Werth, *France, 1940-45*, 1955.

**Petasites**, a genus of 14 species of perennial herbs with rhizomatous roots or stems, family *Compositae*, and found in Europe, Asia, and N. America. *P. fragrans*, Winter Heliotrope, and *P. hybridus*, Butterbur, are found in Britain, sometimes becoming troublesome weeds.

**Petch**, see PEC.

**Petchora**, see PECHORA.

**Peteorde**, see PETWORTH.

**Peter**, St, one of the 12 apostles, and first Bishop of Rome, b. at Bethsaida, on the W. side of the lake of Genesareth; during the period of Christ's ministry his residence was at Capernaum. He was married, but we are not told whether or not he had children. His name was at first Simon (or Symeon, Acts xv. 14), which was changed by our Lord into



Cephas, an Aramaic word signifying a stone or rock, in Greek, *petra*, whence Peter. In conjunction with Andrew, his brother, he followed the occupation of a fisherman. Both were disciples of John the Baptist (John i. 40 ff.), by whom they were taught that Jesus was the Messiah. While following their occupation on the sea of Galilee, Jesus called them to be His disciples, promising that he would make them 'fishers of men.' P. received from Christ the 'commission of the keys' and the first place in the apostolic college. The earliest account of the Resurrection (1 Cor. xv. 5) tells of Christ's appearing 'first to Cephas, then to the twelve,' and the early chapters of Acts show how P. continued in his position as leader. It was he who punished Ananias and Sapphira. He converted Cornelius, a Rom. centurion, the first Gentile to be admitted into the Church without circumcision. It is supposed that he afterwards preached through Pontus, Galatia, Cappadocia, Asia Minor, and Bithynia. The tradition that he then came to Rome is now generally admitted, not only by Rom. Catholics but also by the best Protestant authorities. Here he is said to have suffered death under Nero, being crucified head downwards. See W. M. Taylor, *Peter the Apostle*, 1900; A. S. Barnes, *The Martyrdom of St Peter and St Paul*, 1933; A. T. Robertson, *Epochs in the Life of Peter*, 1933; and L. C. Douglas, *The Big Fisherman* (life in novel form), 1949.

**Peter, First and Second Epistles of.** These two epistles must be considered quite separately. 1 Pet. was written to Gentile Christians of Asia Minor from Rome ('the Church that is in Babylon,' v. 13), and all the evidence is in favour of its having been written, as it claims, by the prince of the apostles and about AD 63 (after Eph. and the end of St Paul's first captivity in 62). See commentaries by C. Bigg, 1901; E. G. Selwyn, 1946; L. J. Radcliffe, 1953.

With 2 Pet. the case is different. There are no certain quotations from it before the letter of Origen, who accepted it as Petrine, though recording the fact that it was disputed. So, too, with Jerome and Eusebius. Lack of quotation is, however, a weak argument, for the epistle is not particularly quotable. A more serious difficulty arises from the difference in style from 1 Pet.; but if, as is most probable, 1 Pet. owes its style to an amanuensis, 2 Pet. may owe its to another. Its use of Jude is no more difficult than 1 Pet.'s use of Rom., Eph., and Jas. Besides this there is a close connection in thought between 1 and 2 Pet., both of which draw upon a common stock of ideas. There is, however, no attempt in one epistle to imitate the other, such as might be expected of a forger: and 2 Pet. explicitly claims to be the writer of 1 Pet., and refers to 'our most dear brother Paul.' See commentaries by C. Bigg, 1901; J. Chaine, 1939; Little (in C. Gore's *New Commentary on Holy Scripture*), 1928; H. Willmering (in *A Catholic Commentary on Holy Scripture*), 1953.

**Peter I, the Great (1672-1725)**, first Russian emperor, youngest son of Tsar Alexis Mikhaylovich (q.v.). When P.'s half-brother Fëdor III (q.v.) d. in 1682 without issue, the Pl. of Moscow and the prin. Boyars (q.v.) decided that P. should be the tsar rather than his older but incompetent half-brother Ivan. The latter's older sister Sophia, however, organised a coup by the palace guards which resulted in the coronation of Ivan and P. as joint tsars, with the appointment of Sophia as regent. The next 7 years P. spent in a vil. near Moscow with his mother. Physically and



PETER THE GREAT  
After Kneller

mentally far in advance of his years, and receiving no systematic education, P. picked up a mass of knowledge and technical skills, mainly from foreigners in Russian service who lived in a suburb nearby—particularly the Swiss Lefort, the Scotsman Patrick Gordon, and the Dutchman Timmerman. In 1689, having received information of a plot by Sophia against him, P. forced her to resign and sent her to a convent, where she d. in 1704. P. left nominal precedence to Ivan, but in fact ruled the country himself. P.'s first care on assuming the gov. was to form an army disciplined according to European tactics, in which task he was greatly aided by Gordon and Lefort. He also strove to create a navy and a merchant fleet. P., thinking the possession of a portion of the Black Sea would best supply the required facilities of accessible sea-board and port, declared war against Turkey, and took the city of Azov after a long siege in 1696. Eager for knowledge, he left Russia in April 1697, in the train of an embassy of which Lefort was the head. In the guise of an inferior official of the embassy he visited the 3 Baltic

provs., Prussia, and Hanover, reaching Amsterdam, where he worked for some time as a common shipwright. To his other studies he added the study of astronomy, natural philosophy, geography, and even anatomy and surgery. On receipt of an invitation from William III, King of England, he visited that country, and for 3 months, spent partly in London and partly in Deptford, laboured to amass all sorts of useful information. He left England in April 1698, carrying with him Eng. engineers, artificers, surgeons, artisans, artillerymen, etc., to the number of 500. He was about to visit Venice also, when the news of a formidable rebellion of the soldiery recalled him to Russia; but before he arrived Gen. Gordon had already crushed the revolt. P.'s wife, suspected of complicity in the conspiracy, was divorced and shut up in a convent.

In 1700 P. entered into an alliance with the Kings of Poland and Denmark to make a combined attack on Sweden. Taking advantage of the Swedes being employed elsewhere, he quietly appropriated a portion of Ingria, in which he laid the foundation of the new cap., St Petersburg, 1703, which in a few years became the Russian commercial depot for the Baltic. In the long contest with Sweden the Russians suffered a series of defeats, but then P. totally routed the Swedish king at Poltava, 8 July, 1709. He next prepared for war with the Turks, who at the instigation of Sweden had declared war against him. In this contest P. lost his previous conquest, the port of Azov and the ter. belonging to it. In 1712 he married his mistress, Catherine (see CATHERINE I.). At the end of 1716 and beginning of 1717, in company with the tsarina, he made another tour of Europe. Soon after this time he ordered the execution of his son Alexey for suspected treason, but Alexey d. before sentence could be carried out. In 1721 peace was made with Sweden. In 1722 P. commenced a war with Persia and compelled the shah to hand over the 3 Caspian provs. along with the tns of Derbent and Baku. P. introduced many reforms, the most important of which were the abolition of the Moscow Patriarchy and its replacement by a synod subordinated to the tsar; the reform of the central gov., with the setting up of specialised gov. depts; the reform of prov. administration, with the appointment of prov. governors; the introduction of a properly organised military and civil service open to any suitable person irrespective of origin; and financial reforms, including the introduction of a poll tax. After the end of the Northern War in 1721 P. was proclaimed emperor, and in 1722 promulgated a new law of succession, which enjoined that each monarch should nominate his own successor. P. did much to develop Russia's trade and industry, and encouraged scholarship. Though personally cruel and barbaric in many of his habits, he was indeed a great monarch, who transformed Russia and brought her into the concert of the great European powers. See B. H. Sumner, *Peter the Great and the Russian Empire*, L., 1950.

**Peter II (1715-30)**, Emperor of Russia, grandson of Peter the Great. He succeeded to the throne in 1727 on the death of Catherine I; the country was ruled by the Supreme Privy Council. Died of small-pox.

**Peter III (1728-62)**, Emperor of Russia and Duke of Holstein, b. Kiel. He succeeded his aunt Elizabeth, 1762, and immediately returned to Frederick the Great all the Prussian provs. conquered by Russia during the Seven Years' War. Weak-minded and futile, he happened to follow good advice in issuing the famous Edict freeing the gentry from state service. He was overthrown by a conspiracy of the Guards in favour of his wife, Catherine II. He is believed to have been put to death by Catherine's favourite, Orlov.

**Peter II (1813-51)**, prince of Montenegro, ruled from 1830 to 1851. A statesman and a reformer, he was also a poet of some distinction. He was the last of the Vladikas, or prince-bishops.

**Peter I, Karageorgević (1844-1921)**, King of Serbia, b. Belgrade. He was the son of Alexander Karageorgević, and grandson of Czerny Djordij (q.v.), who had headed the Serbian insurrection of 1804 against the Turks. In 1883 he married Princess Zorka, daughter of the King of Montenegro. He was proclaimed King of Serbia (1903) after the murder of Alexander Obrenović and crowned in 1904. In the First World War he shared in the disastrous Serbian retreat across Albania in 1915, and only returned to the cap. in Nov. 1918, being invited, shortly afterwards, to accept the crown of Yugoslavia, the triune kingdom of Croats, Serbs, and Slovenes. See also SERBIA.

**Peter II (1923-)**, King of Yugoslavia 1934-45. On the assassination of his father, P. ruled under his uncle's (Prince Paul) regency. The latter planned to join the Axis powers in 1941, but P. led a revolt and assumed power. The Ger. invasion compelled him to seek refuge in England, where he married Princess Alexandra of Greece in 1944, by whom he has 1 son, Prince Alexander. Conflict with other allied govts. was caused by P.'s support of Mihailovich (q.v.) and his hostility to Tito (q.v.), and in 1945 the new Yugoslav regime abolished the monarchy. P., who had gone to Egypt as a result of his disagreement with the Allies, had his property confiscated and was deprived of his nationality.

**Peter Canisius**, see PIETER DE HONDT.

**Peter Damian**, St (1007-72), It. ecclesiastic. In 1035 entered the hermitage of Fonte Avellana, near Gubbio, a severe and ascetic estab., of which he became head in 1043. He soon went into political life, entering upon a correspondence with the Emperor Henry III, and in 1049 writing to Pope Leo IX, *Liber Gomorrhianus*, in which he denounced the vices of the clergy. In 1058 he became a cardinal and Bishop of Ostia, and gained a signal victory for papal authority at the Council of Milan in 1059. Declared a Doctor of the Church in 1828; his feast is on 23 Feb. His collected works, which

are mainly directed the marriage of the cl. 4 vols. at Rome, under Cardinal Cajetan, in 1606-15.

**Peter Lombard**, see LOMBARD.

**Peter Martyr**, St (1206-52), a Dominican, b. at Verona; canonised in 1253. He was remarkable for his zeal against heretics, against whom he worked vigorously as Grand Inquisitor in Lombardy. He was murdered near Como by Catharists. His feast is on 29 April.

**Peter Martyr** (Vermiglio) (1500-62), Protestant divine. He was in succession Abbot of Spoleto, prior of a convent in Naples, and later prior of a rich abbey at Lucca. Becoming imbued with Protestant views, and fearing for his life, he refused to attend a council at Genoa and fled to Pisa and then to Zürich. Afterwards he became prof. of divinity at Strasburg. In 1547, at the invitation of Cranmer, he came to England and was appointed to the chair of theology at Oxford. On Queen Mary's accession he returned to Strasburg, and in 1556 went to Zürich.

**Peter of Abano** (Petrus Abanus) (1250-1316), b. Abano Bagni (q.v.). Studied first at Padua; went to Constantinople to study Greek, and afterwards to Paris, studying medicine and mathematics. Travelled in England and Scotland, but in 1303-4 was recalled to Padua to be prof. of medicine; his reputation was great and his fees high. With astronomy he studied astrology, and made some pretence to magic. In 1306 this study brought him before the Inquisition as a magician, but he cleared himself. In 1314 he was invited to Treviso, where he went. Next year another accusation was brought against him and he came up for trial; he d., however, before judgment was given. The inquiry continued after his death: he was found guilty and his body was burned. He wrote sev. works on philosophy and medicine, and made translations of ant and Arabic medical writers. He was the most learned physician of his time. His best works were his *Conciliator differentiarum*, an attempt to reconcile all differences between Arabic and Gk medical thought, and his *De venenis*, an important treatise on toxicology.

**Peter of Blois**, or Petrus Blesensis (c. 1135-c. 1205), Fr. cleric and writer, b. at Blois. He studied law at Bologna. He became tutor to the future William II of Sicily, and came to England c. 1172. He was made first, chancellor to the see of Canterbury, and then appointed to the archdeaconry of Bath. On the death of Henry II P. remained in the employment of Queen Eleanor, and afterwards was appointed archdeacon of London. His letters are historically interesting from the notices they contain of contemporary events and manners.

**Peter the Cruel**, see PEDRO THE CRUEL.

**Peter I Island**, in the Antarctic, is 9 m. long, 4 m. wide, with a height of 4000 ft. It was the first land to be discovered S. of the Antarctic Circle, by Capt. F. von Bellinghausen of the Imperial Russian Navy in 1821. It was explored by

Norwegian expeditions in the 1820s, and now belongs to Norway. See L. Christensen, *Such is the Antarctic*, 1835.

**Peter the Great Gulf (Bay)**, or Golden Horn Bay, wide inlet of the sea of Japan, on the coast of Russian Far East, stretching from the Tumen R. (Korea frontier) to Cape Povorotnyy. Vladivostok, a terminus of the Trans-Siberian Railway, is its chief port.

**Peter the Hermit** (c. 1050-1115), a soldier of European birth, but whose bp. is unknown, lived for some time as a hermit in Palestine. Returning to the W., he preached the first crusade, in which he fought. Afterwards he founded the monastery of Neumoutier in Flanders. See CRUSADES.

**Peter the Venerable**, or Peter of Montboissier (c. 1092-1156), Fr. monk, and Abbot of Cluny from about 1122 to his death. In about 1130 he wrote his *Epistola seu Tractatus adversus Petrobusianos* against the disciples of Peter of Bruys and Henry of Lausanne, whom he charged with preaching heresy in the S. of France. He took part in the council of Pisa (1134), and is said to have been influential in securing the papal throne for Innocent II. P. is noted for befriending Abélard in his last days.

**Peterborough**: 1. City and municipal bor., situated in the administrative co. of the soke of P., mainly in Northants but partly in Hunts, England, on the R. Nene, 42 m. NE. of Northampton. It is a bishop's see and has a fine cathedral, begun in 1117, formerly the church of a Benedictine monastery. Architectural styles range from the Norman to the Perpendicular period, and prior to the Reformation it was considered one of the most magnificent in the kingdom. The first monastery was founded in the 7th cent., but was totally destroyed by the Danes in 870. In 972 a new monastery, founded by Æthelwold, Bishop of Winchester, was endowed by Edgar the Peaceful, and, fortified by Abbot Kenulph, it acquired the name of Burgh. The second church was destroyed by fire in 1116, and in the following year the building of the third church began. The 3-arched W. front was completed in the reign of John, and many additions and alterations to the building were made almost up to the time of the surrender of the monastery in 1539, when the church was selected as one of the 6 cathedrals to be refounded from monastic churches in 1541 by Henry VIII, on the advice of Cranmer. The city was created by letters patent of Henry VIII on 4 Sept. 1541. Before the dissolution there had been a small mesne bor. dating back to the Norman era, the tn growing up round the monastery. Both tn and monastery were sacked by Hereward the Wake and the Danes in 1071, and the abbey tenants shared in the peasants' revolt during the reign of Edward II. The remains of Catherine of Aragon, wife of Henry VIII, lie in the cathedral, and those of Mary, Queen of Scots, lay buried here for a quarter of a century. In 1643 the cathedral was despoiled by Cromwell and

his soldiers, who destroyed most of the monuments and stained glass.

Formerly the powers of local gov. in P. were divided between the dean and chapter as lords of the manor, whose steward presided over a court leet held in and for the city, and a rival parochial authority, holding certain tin estates, known as the feoffees and governors of the tin lands and stock, but in 1874 the city became a municipal corporation. It is now governed by a mayor and corporation, comprising 9 aldermen and 27 councillors. There is a separate co. council for the soke of P., estab. in 1888, with 10 aldermen and 32 councillors. The justices for the soke of P. have by long-standing commissions (especially preserved by the Justices of the Peace Act, 1949) full powers of Judges of Assize, though in practice do not exercise their rights in the most serious classes of cases. The Marquess of Exeter, who is hereditary lord paramount, also holds the office of *custos rotulorum* for life by a grant from the Crown and is chairman of the justices in quarter sessions, though he has appointed the P. co. court judge as his deputy to preside at the sessions.

P. grew up as, and remains, the marketing centre for an important agric. area. It is a busy railway tn (being a junction of the N.E. and Midland regions), and has large workshops for the manuf. of railway plant. It has now become an industrial centre, the chief trade being engineering, including in particular the manuf. of diesel engines, ovens and catering machinery, turbines, marine auxiliaries, and pumps. There are important manufs. of bricks in the adjoining areas of Fletton, Whittlesey, and Eye, and in the city at Dogsthorpe. Cattle and corn mkrts are held weekly: the well-known Bridge Fair is held annually during the first week in Oct., and a famous agric. show and the Royal Foxhound Show in July. P. formerly sent 2 members to Parliament, but now forms part of the P. div. in the cos. of Northants and the soke of P. Pop. 53,412.

2. City of Ontario, Canada, administrative centre of P. co., on the Otonabee R. 70 m. N.E. of Toronto and 28 m. N. of Lake Ontario. It is an important manufacturing centre, with over 100 industries employing 10,000 persons, with ann. production valued at more than \$120 million (1952). It has the largest cereal mill in the Brit. Commonwealth (Quaker Oats) and the largest electrical apparatus plant (Canadian General Electric). It specialises also in the manuf. of canoes and boats, motors for watercraft, and clocks and watches. Other products include dairying equipment, yarns, rugs and carpets, woven labels, locks and hardware, food beverages, meat products, canned foods, electrical motors, and finished wood products. The largest deposit of nepheline, used in the manuf. of glass, in the world is being mined N. of the city, and the refined product is shipped to the glass industry over the world. It is the centre of a beautiful lake dist. which annually attracts thousands of visitors from the

U.S.A. and Canada for summer recreation. It is on the Trent Canal, an inland waterway, joining Lake Ontario with Georgian Bay, and the largest liftlock in the world is at P. It is the chief commercial centre for central Ontario, and its stores supply a marketing area containing more than 150,000 persons. Much of the electrical power is developed near by along the Otonabee R. Pop. 40,489.

3. Tn of S. Australia, 70 m. from Port Augusta, an important railway junction, connected by rail with Adelaide and other tns. Pop. 3000.

**Peterborough and Monmouth, Charles Mordaunt, third Earl of (1658-1735)**, sailor and soldier. He began his adventurous life at 17 by serving in the Eng. Mediterranean fleet against the Barbary corsairs. He went to Holland in 1686, returning 2 years later with William of Orange. On the accession of William, P. was in succession made privy councillor, first lord of the treasury, and earl of Monmouth. He was one of the Council of Nine appointed to advise Queen Mary during William's absence in Ireland (1690), and in the following year served with distinction in Flanders. In 1697 he was imprisoned in the Tower for his suspected connection with Fenwick's plot, but on the death of William he regained favour. His greatest achievement was his campaign in Spain during the Sp. War of Succession, when he took Barcelona. His conduct caused much controversy in England, however, and he was recalled in 1707. Later he served in various diplomatic posts. He was a patron of literature and the arts.

**Peterhead**, seaport and burgh of E. Aberdeenshire, Scotland, in Buchan dist., on the N. side of P. Bay. The national 'harbour of refuge' was begun by convict labour (1886) and the S. breakwater was completed by 1921. Work on the N. breakwater is now nearing completion. There is a submarine cable between P. and Egersund in S. Norway. Keith Inch, out off by the harbour from the tn proper, has fish-curing (chiefly herring) estabs. White fishing has developed since 1945. The celebrated 'P. red granite' is quarried. Shipbuilding, granite-polishing, woollen manufs, precision engineering, and fish and vegetable canning are among the chief industries. Pop. 12,800.

**Peterhof**, or **Petergof**, see **PETRODVORETS**.

**Peterhouse College**, Cambridge, founded in 1284 (the earliest of Cambridge colleges) by Hugo de Balsham, Benedictine Bishop of Ely. The beautiful par. church of St Mary the Less, 1352 (formerly St Peter), was used as the college chapel. The Hall is in plan, and structurally in part, that built by the founder. The Perne Library, 1632, includes a bequest made by Dr Andrew Perne, master 1553-89, and the present chapel was consecrated in 1632.

**Peterloo Massacre**, name given to the happenings of 16 Aug. 1810 in Manchester. On that date a large body held a meeting in favour of parl. reform, under the leadership of Henry Hunt. The magistrates

ordered the meeting to be broken up by the military, including sev. troops of horse; as a result 11 lives were lost and about 500 people were injured. The meeting took place in St Peter's Field (now the site of the Free Trade Hall), hence the name Peterloo (in imitation of Waterloo). See D. Read, *Peterloo*, 1957.

**Peteromys**, see FLYING-SQUIRREL.

**Peters**, or **Peter**, **Hugh** (1598-1660), Puritan, educ. at Trinity College, Cambridge. He emigrated to Holland and then to New England, estab. a colony at Saybrook, Connecticut, and was a co-founder of Harvard College. He became the minister of the first church at Salem, Massachusetts. P. returned to England in 1641 to represent Massachusetts Bay Colony, and served with the forces of Cromwell and Fairfax as an army chaplain. He took part in parliamentary politics and pub. many pamphlets, and, in 1660, at the Restoration, was executed for his part in the execution of Charles I. P.'s acts of kindness to some of the Royalist clergy are recorded in Walker's *Sufferings of the Clergy*.

**Peters** (**Peeters**), **Jan** (1625-77), Flem. marine painter. The 'Port of Oran' is his masterpiece, and his 'Destruction of the English Fleet at Chatham, 1667,' is at Amsterdam.

**Peter's Pence**, also called **Romescoot**, **Rom-feoh**, tax or tribute imposed by the Pope on the Eng. at the beginning of the 10th cent., of a penny for every hearth or house, payable at Lammas Day (1 Aug.). From England the practice spread to other countries of Europe. The anti-papal feeling in England which, in the reign of Edward III, produced the Statute of Provisors, and in Richard II's the Statute of Praemunire, did not alter the fact that the Pope received an ann. sum of £200 as composition for P. P. during that period, although the tribute was temporarily stopped for a short time in the reign of Edward III. The payment of P. P. and other papal exactions was finally forbidden by an Act passed in 1534. P. P., revived by Pius IX, is now paid as a voluntary offering by Rom. Catholics throughout the world.

**Petersburg**, city and port of entry of Virginia, U.S.A., on the Appomattox R., 22 m. S. of Richmond. Cotton, silk, tobacco, flour, textiles, optical goods, luggage, and machinery are manufactured, and there are fine granite quarries. During the Amer. Civil War P. was almost the last stronghold of the Confederate Army, being defended by 9 m. of fortifications. Against P. Gen. Grant entrenched the Federal Army, and the siege lasted 9 months from July 1864. The Federal losses before P. amounted to some 10,000. The present pop. of P. is 35,054.

**Petersburg**, St, see Leningrad.

**Petersen** **Coil**, see ARC-SUPPRESSION COIL.

**Petersfield**, urban dist. and mkt tn of Hants, England, 16 m. NNE. of Portsmouth. It has a mediæval church. Bedale's school, a co-educational estab., and Donal Junior School are near to P. Pop. 6949.

**Pethick-Lawrence**, **Lady Emmeline** (1867-1954), leader of the women's suffrage movement, b. Emmeline Pethick in Bristol; educ. at private schools in England, France, and Germany. After social work for sev. years, she joined the Pankhursts (q.v.) in the militant Women's Social and Political Union in 1906, and worked with them till 1912; in 1914 she joined the newly-formed United Suffragists. She was imprisoned 5 times for suffragist agitation. In 1901 she married F. P. Lawrence (later Lord P.-L., q.v.), editor and part owner of the London evening paper, *Evening Echo*. In 1913 she became joint editor with him of *Votes for Women*. She was invited to America in 1914 to promote the Women's International League for Peace. While there, she helped to inaugurate the campaign which led to the political enfranchisement of Amer. women. She was Labour candidate for Rusholme, Manchester, in 1918. She wrote *My Part in a Changing World*, 1938.

**Pethick-Lawrence**, **Frederick William**, first Baron (1871- ), politician, educ. at Eton and Trinity College, Cambridge, became a barrister. He ed. the *Echo* (1902-5), the *Reformer's Year Book* (1904-8), and the *Labour Record and Review* (1905-7). In 1901 he married Emmeline Pethick, assuming her surname, and was prominently associated with her in the feminist movement, being imprisoned in 1912 for his activities in that connection. Elected Labour M.P. for W. Leicester 1923-31, he was financial secretary to the Treasury. He took part in 1931 in the Indian Round Table Conference in London. As secretary of state for India, 1945-7, he visited India as a member of the Cabinet mission and took part in the independence negotiations. He was created a baron in 1945. His autobiographical *Fate has been Kind* appeared in 1943, and he has written on economic matters.

**Pethidine**, synthetic drug with the formula  $C_{17}H_{19}O_2N \cdot HCl$ , used as an analgesic and as a substitute for morphine, though it is less powerful than the latter. It is useful in childbirth. The dose is 1-1½ gr. (10-100 mg.) by intramuscular injection. P. has a mildly euphoric action, and addiction to it is rapidly acquired. Its issue to midwives for use in obstetric cases is strictly controlled.

**Petiole**, leaf stalk of a plant. It is usually cylindrical and narrow, though occasionally it is elaborated into very remarkable forms, such as the pitchers of pitcher plants.

**Pétion**, or **Péthion**, **de Villeneuve**, **Jérôme** (1753-94), Fr. revolutionary, b. Chartres. He was prominent as a member of the Jacobin Club and associate of Robespierre. Chosen mayor of Paris (1791) in preference to La Fayette, he then became Girondist deputy to the Convention (1792-3), but was accused of being an accomplice of Dumouriez and proscribed. The exact manner of his death is unknown, but his body was found near St Emilion in June 1794.

**Pétis de la Croix**, **François** (1653-1713),

Fr. orientalist, b. Paris, son of François (d. 1695). He became prof. of Arabic at the Collège Royal, Paris (1692). He trans. *Histoire de la Sultane de Perse et des Vénitiens*, from the Turkish tales of Chokh-Zadeh, 1707, *Mille et un jours*, 1710-12, and *Histoire de Tamerlan* (Tamerlane), 1722, from the Persian.

Petit Brabançon, see GRIFFON BRUXEL-LOIS.

**Petitio Principii**, in formal logic, that species of false reasoning which consists in tacitly assuming the proposition to be proved as a premise of the syllogism by which it is to be proved, or, in other words, in taking the conclusion itself as one of the premises. The nature of this fallacious argumentation is popularly expressed in the phrases 'begging the question' or 'reasoning in a complete circle.' This kind of fallacy frequently occurs in long arguments and in verbose metaphysical writings. Again, it is an easy pitfall for those who employ a mixture of Saxon, Lat., and Gk words in formulating definitions which on investigation turn out to be mere identical propositions; thus 'Consciousness must be immediate cognition of an object, for I cannot be said really to know a thing unless my mind has been affected by the thing itself.'

**Petition of Right** (1628), document embodying parl. demands and presented to Charles I in 1628 by the Commons. In view of certain unconstitutional practices of Charles, the Commons met and resolved themselves into a Committee of Grievances to consider 'the liberty of the subject in person and estate,' especially in matters of taxation. Wentworth and Pym were the prin. authors of the P., though the views expressed in the final draft were far more extreme than Wentworth's, and probably helped to drive him over to the king's party. The king eventually signed it in June.

**Petition of Right**, constitutional means by which alone, until 1947, the subject could obtain legal relief against the Crown, for the legal impeccability of the sovereign, coupled with the fiction that the courts are his or her own, made it impossible for the subject to sue by an action at law. A P. of R. was presented to the Crown through the Home Office, which transmitted it to the attorney-general. Relief by P. of R. could be claimed only for money due under a contract, or for restitution of or compensation for property of which the Crown had obtained possession; but never for a tort (q.v.) alleged to have been committed by the king. Where a tort had been committed by a Crown servant in the course of his employment (e.g. injuries caused by the negligence of a post-office van driver), he had to be sued personally, although, in practice, the Crown would usually pay any damages awarded against him. The P. of R. procedure is now obsolete, as under the Crown Proceedings Act, 1947, gov. depts can be sued on their contracts and for the torts of their servants.

**Petitions**. The right of petitioning the Crown and Parliament has been exercised

from the earliest times. But for many centuries it was restricted to P. for redress of private and local grievances, and the remedies sought have since been provided by courts of equity and by private Acts. The practice of petitioning on political subjects came into vogue during the period of the Great Rebellion, many P., signed by large bodies of people, being presented both to Charles I and the Long Parliament; and it was probably the intimidation exercised by numerous petitioners in the Long Parliament that led to the Act of 1661 against 'tumultuous petitioning.' This Act provided that no petition (unless the contents had been previously approved by 3 justices of the peace or a grand jury) should be signed by more than 20, or delivered by more than 10, persons. By the Bill of Rights the right of the subject to petition the king was expressly sanctioned; but the Commons for a long time showed themselves intolerant of a free expression of opinion, and jealous of interference with their functions. The 1661 Act has long been practically a dead letter, and when a petition is presented, its conditions are not usually complied with.

**Petitot, Jean** (1608-91), Fr. painter in enamel, b. Geneva. In England he met Van Dyck (c. 1634), who introduced him to Charles I. P. painted portraits of the king and his court, and made miniature copies of many of Van Dyck's pictures. A portrait of the Duchess of Southampton (1642) in the Duke of Devonshire's collection is considered his masterpiece. At Paris he enjoyed the patronage of Louis XIV. The Louvre 'Gallery of Apollo' contains many of his works. See E. Stroehlin, *Petitot et Bordier*, 1905.

**Petits Chevaux**, see ROULETTE.

**Petkov, Nicolai** (1889-1947), Bulgarian politician, b. near Sofia, a lifelong member of the Agrarian party. A strong opponent of Nazism, P. was one of the founders of the Fatherland front (see BULGARIA, *Historical*), signing the Moscow armistice which brought Bulgaria into the war on the side of the Allies (Sept. 1944). When the Fatherland front was formed, P. became deputy Premier, but resigned in Aug. 1945 and went into opposition, thus incurring the enmity of the Communists, who had previously been his colleagues. He was arrested in June 1947 and charged with complicity in a military conspiracy, which he strenuously denied. The conduct of the trial led to a strong protest by Britain and the U.S.A., but P. was sentenced to death. After his execution the Agrarian party was dissolved.

**Petőfi, Sándor** (1823-49), national poet of Hungary, b. Kis Kőrös, married Julia Szendrey, 1847. Although he wrote some longer poems, his best work is in his shorter lyrics. Such poems as *At the end of September*, *At the end of the village*, and the patriotic *Up, Hungarian*, rank high in European literature. His death at the battle of Segesvár (1849) is foreshadowed in *One Thought Troubles Me*. Among his chief collections of lyrics may be mentioned *Pearls of Love*, 1845; *Starless*

*Nights*, 1845; and *Clouds*, 1846. Among Eng. translations are: Bowring's *Translations from A. Petřst*, 1866, and *Sixty Poems* by E. B. Piere and E. Delmar, Budapest, 1948.

**Petra**, ruined city of Jordan, situated in the dry bed of the Wadi Musa, on an ancient caravan route some 115 m. SSW. of Amman, usually approached from the E. through a narrow gorge (the Siq). P. was the cap. of the Nabataeans (see NABATAEI); some Biblical scholars have seen P. as the Edomite city of Sela (II Kings xiv. 7). It lies in a steep-sided basin, and contains over 750 tombs and tomb-temples, their façades cut in the living rock, constructed chiefly between 100 BC and AD 100. Among the most impressive are the beautiful Khazne Faraoun ('Pharaoh's Treasury') dating from early Christian times, and El Deir ('The Monastery'), which was probably used primarily as a temple. There is an amphitheatre (c. 1st cent. AD) and some remains of the Rom. city. The Nabataeans successfully repelled the Seleucids and the Ptolemies, but were incorporated in the Rom. Empire in AD 106. With the exploitation of Palmyra (q.v.) as a caravan centre P. declined in importance, and by the end of the 3rd cent. it was largely abandoned. In the 5th cent. it became a small Christian see. During the Crusades small Frankish forts were built in the area. Burckhardt rediscovered P. in 1812 and was amazed by the reds, browns, purples, and ivory of its sandstone. See G. and A. Horsfield, 'Sela-Petra', in *Quarterly of Palestine Dept. of Antiquities*, vols. 7, 8, 1938-9; M. A. Murray, *Petra*, 1939.

**Petrarch** (Francesco Petrarca) (1304-74), It. poet and leader of the revival of learning, b. Arezzo. In 1312 he went with his parents to Avignon, the seat of the papal court. He began to study law at Montpellier, and subsequently at Bologna, but the profession was repugnant to his poetic temperament, and to his passionate admiration for classical literature, in which Cicero and Virgil were his chief models. In 1326 he returned to Avignon and was ordained, but his interests and mode of life continued to be secular. In 1327 he for the first time saw Laura, who was the ideal love of his life. She died in 1348, and is only known by the sonnets (*Canzoniere*); who she was is wholly uncertain, and the early biographies never refer to her. She was the chief inspiration of P.'s sonnets, which were his greatest contribution to It. literature, and moulded the lyric poetry of the Renaissance. At Avignon he came under the protection of the Colonna family, whose service he entered. After 1333 he travelled widely, but he soon sought the retirement he loved best at Vaucluse, near Avignon. Here he conceived the project of his poem, *Africa*, written in Latin, on the subject of Scipio Africanus. He wrote most of it in 1339. In 1340 he received invitations from the univ. of Paris and from the senate of Rome to accept the laurel crown of the poet. The coronation of P. took place on the Capitol at Rome on 8 April 1341. He was the first to receive

the honour of this revived rite on the Capitol. His latter years were spent at Milan, Venice, and finally Argus, near Padua. He had many benefices of which he enjoyed the income, and was the favoured correspondent of popes, kings (especially of Robert of Naples), and of statesmen, as well as the friend of Boccaccio. The house at Arezzo in which he was born was regarded as a sacred place. He was anxious to bring about the return of the papal court from Avignon to Rome, and to restore Rom. independence.



PETRARCH

P.'s chief title to fame was his passion for the recovery of ancient literature, which he believed to have the power of restoring antique virtue, culture, and social order to a degraded age. He urged the rulers of his day to copy Camillus, Scipio, and the heroes of Rom. hist. He knew no Greek, his Latin was stiff and showed little true scholarship, but he inspired the new feeling towards ancient studies, and more than any one man determined the bent of the intelligence of the young towards antiquity, his influence at Padua Univ. being remarkable. He varied against the medieval conception of life, especially against all terrifying superstitions, and against astrology. He died, leaving many illegitimate children, at Argus, a small town in the Euganean hills, where he is buried. His *Letters* (in Latin) fill 5 vols. He wrote *De remediis utriusque fortunae*; *De viris illustribus*; *Carmen Bucolicum*; *De contemptu mundi*; *Libri rerum memorandorum*. His It. poetry, which greatly influenced Eng. and Fr. love poetry, consists of the sonnets, *Canzoniere*, or *Rime in vita e morte di Madonna Laura*, and the allegorical *Trionfi*, or *Triumphs of Love, Death, Chastity*, etc. A complete ed. of P.'s works (*Edizione Nazionale*) is in course of pub. at Florence (first vols. pub. 1926). See F. de Sanctis, *Saggio*

*Critico sul Petrarca*, 1869; P. de Nolhac, *Petrarque et l'humanisme*, 1892, 1907; M. F. Jerrold, *Francesco Petrarca*, 1909; E. H. R. Tatham, *P. Petrarca*, 1925; U. Bosco, *Francesco Petrarca*, 1946; E. H. Wilkins, *The Making of the Canzoniere and Other Petrarchan Studies*, 1951.

**Petrassi, Goffredo** (1904- ), It. composer, b. at Zagarolo near Rome, studied at the Conservatorio di Santa Cecilia there and came under the influence of Casella and Hindemith. In 1939 he became prof. of composition at his former school. His church music and choral works are particularly important, but he has also written 2 operas, 2 ballets, incidental music for *The Birds of Aristophanes*, film music, orchestral and chamber works, and songs. See F. D'Amico, *Goffredo Petrassi*, 1942.

**Petrel**, oceanic birds, including the albatross, diving P., flat-billed P., Shearwater P., and fulmar P., all of which have a hooked bill, rudimentary hind toes, and tubular nostrils. The Storm-Ps or 'Mother Carey's Chickens,' are put into the family Hydrobatidae. The plumage of the stormy-petrel (*Hydrobates pelagicus*) is smoky brown with a broad band of white above the tail. Marine crustacea constitute the natural food, but the bird has acquired the habit of following ships to collect the fragments that fall. It is able to run lightly over the surface of the water with the aid of its wings, and this habit has given it the name of P. after St Peter.

**Petri, Olaus** (1497-1552), Swedish reformer, b. Örebro; from 1525, with his brother Laurentius, he laboured to spread Lutheranism throughout Sweden. They also trans. the Bible into Swedish. From 1531 to 1533 P. was chancellor to Gustavus Vasa and preacher at Stockholm (1539). He was condemned to death (1540) for refusing to reveal a plot of which he had learnt in the confessional, but was pardoned and allowed to continue as pastor at Stockholm (1543). He left, besides religious writings, a mystery play and *Svenska krönika* (see ed. of 1860). Strindberg dramatised his life. See also J. Schück, *Olaus Petri*, 1893.

**Petrieleu-Hagden, Bogdan**, see HAGEDU.

**Petrie, Sir William Matthew Flinders** (1853-1942), Egyptologist, b. Charlton. He was befriended by Amelia Edwards, the founder of the Egypt Exploration Fund; surveyed the Giza pyramids in 1880, and excavated Tanis and other sites for the Egypt Exploration Fund during 1884-6. He then left the Egypt Exploration Fund and excavated independently from 1887 to 1895. He inaugurated the chair of Edwards Professor of Egyptology, Univ. College, London, in 1894-1933, and founded the Egyptian Research Account in 1894, renaming it the British School of Archaeology in Egypt, in 1906. In 1933 he transferred his activities to Palestine. In addition to ann. vols. describing his excavations, P. pub. many books, scientific and popular, and amassed the best teaching collection of Egyptian antiquities in the world at Univ. College, London, though his most important finds are in the

Cairo Museum and in museums in England and America. D. at Jerusalem.

**Petrification**, the process by which the fossilised remains of animals or plants are replaced by minerals such as calcite, silica, iron pyrites, or calcium phosphate. If the mineral-bearing waters infiltrate slowly into the minute cellular cavities, the finest structural details of an organism may be perfectly preserved. But frequently it is only the gross external shape of the original fossil which remains after P.

**Petrissage**, see MASSAGE.

**Petrodvorets** (until 1944 **Peterhof**), tn in Leningrad Oblast, U.S.S.R., on S. shore of Gulf of Finland. It is famous for its 18th-19th cent. imperial palaces and parks with majestic fountains and cascades. Ruined during the German occupation 1941-3, partly rebuilt.

**Petrograd**, see LENINGRAD.

**Petrographic Province**, term used in geology to denote a portion of the earth's crust within which the igneous rocks formed at one period of geological time appear to be genetically related and share certain features in common. The volcanic ls. of the Pacific made up of basaltic lavas with occasional trachyte lavas provide an example of a P. P. Another P. P. is the Tertiary Arcto-Brit. P. extending from NW. Britain through the Faeroes and Iceland to E. Greenland; this P. P. is marked by extensive sheets of plateau basalt and by central volcanoes from which acid and basic rocks were extruded. It is generally supposed that the igneous rocks of any P. P. owe their origin and thence their resemblances to some deep-seated cause. Certain kinds of P. P. are frequently associated with certain kinds of geological event; thus alkaline lavas appear in regions remote from orogenic belts; the Tertiary to recent vulcanicity in the Rift Valleys of Africa provides an example of this.

**Petrography**, see PETROLOGY.

**Petrokrepost'** (until 1611 **Oreshok**, then **Nöteborg**, 1702-1944 **Shlissel'burg**), tn in the Leningrad Oblast of NW. Russia, situated where the Neva leaves Lake Ladoga. It has an old fortress used from the 18th cent. as a political prison. P. was founded in 1323 by Novgorodians, and 1611-1702 was Swedish; it was occupied by the Germans 1941-3. Pop. (1932) 8500.

**Petrol** (**Gasoline**, **Motor Spirit**, **Aviation Spirit**), fuel obtained by refining natural petroleum (q.v.), and used for internal-combustion engines in motor vehicles and aircraft. Some use has also been made of it as a heating fuel and illuminant. Various grades of P. are manuf. for different purposes, incorporating different proportions and types of the hydrocarbons derived from crude petroleum, as well, sometimes, as certain materials not obtained from crude petroleum, such as benzole (from coal) and alcohols. The constituents of a P. rarely fall outside a boiling range of about 30-200° C. The crude oil from which a particular P. is obtained may have some effect upon its composition, but often impurities carried



over from the crude may be particularly undesirable, such as sulphur in aviation spirit, and may have to be removed by special refining processes. Comparison between certain features of a typical aviation and a typical motor spirit are given below:

	100-octane aviation spirit	Motor spirit
Specific gravity . . . . .	0.724	0.733
Per cent carbon . . . . .	85.1	85.5
Per cent hydrogen . . . . .	14.9	14.4
Per cent sulphur . . . . .	0.01	0.1
Boiling range . . . . .	42-170° C.	37-185° C.

Aviation spirit has, however, a higher proportion of low boiling-point constituents. Much importance is attached to the prevention of 'knocking' or 'pinking' in P. engines, which may be affected by the composition of the fuel. Aromatic hydrocarbons have a high anti-knock value. It is usual, however, to add tetraethyl lead (q.v.) for this purpose. In addition to its resistance to knocking, an important characteristic of a P. is its calorific value (i.e. its ability to produce heat as a result of combustion). The most valuable P. constituents from this point of view are the paraffin hydrocarbons, which are also the most stable and are consequently used as the main constituent of motor and aviation fuels. About one-third of the U.K.'s consumption of petroleum products is in the form of P., the total amount of aviation and motor spirit used in 1955 being just under 3 million tons.

**Petrol Rationing** came into force in the U.K. at midnight of 22 Sept. 1939. The basic ration for private motorists was abolished altogether on 1 July 1942, after which allowances were granted only in cases of genuine need. This basic ration was restored in 1945 soon after the war in Europe ended. It was again abolished in 1947, but was restored not long afterwards. Petrol rationing, however, did not end until May 1950. Owing to the Suez crisis it was reintroduced 'as a temporary measure' in Dec. 1956 and ended in May 1957.

**Petroleum (Rock Oil)**, natural oil composed of hydrocarbons existing at various places in the earth's crust. The existence of P. has been known for many cents, but it is only within the last 100 years that its uses have been appreciated to any extent. P. and the products derived from it are now used in numerous ways: as fuels for power, heating, and lighting, as lubricants, and as the source of a wide range of chemical products such as solvents, detergents, plastics, synthetic rubber and fibres, fertilisers, insecticides, and weed-killers. One form of P., bitumen (q.v.), has been used since the earliest times as mortar for building and for caulking boats. P. occurs in certain geological formations, but the best supplies are from carboniferous, Silurian, and from Tertiary formations, intermediate strata providing much less. Various theories as to the genesis of P. have been advanced, such as (a) by the

action of steam on carbides, (b) by the decomposition of the remains of marine organisms. The latter theory has gained general acceptance. As deposits of organic material formed at the bottom of the sea, layers of sand and sediment gradually buried them. In the course of

time they thus became subjected to considerable pressures, as well as to the action of anaerobic bacteria and the influence of changing temps. The oil produced by this process tended to migrate from the beds where it was formed to regions of lower pressure. In some places P. is found at the earth's surface in the form of seepages, in others it is found trapped at greater or lesser depths in porous formations sealed off by caps of impervious rock. In the places where these seepages occurred, the P. was collected in very early days by the local inhab. for domestic use. It has been suggested that the burning fiery furnace into which Shadrach, Meshach, and Abed-nego were cast by Nebuchadnezzar was nothing more than a seepage that had become ignited. In cases where the P. has become trapped below the earth's surface, wells (see OIL WELLS) are sunk. There were hand-dug wells in Burma in the 13th cent., and the economic possibilities of the P. recovered were at least partly developed.

The first well dug by other than hand power was drilled by Edwin Drake in Pennsylvania in 1859. Drake struck oil 69 ft below the surface, using a steam engine driving a punching tool. Originally this percussion method of drilling was used almost exclusively, but it has now been practically entirely superseded by the rotary method. Many other improvements in the techniques of drilling for P. have been made since that time. The wasteful 'gusher' has been almost eliminated as a result of efficient control methods. Exploratory wells with depths of as much as 20,000 ft have been dug in the search for new deposits. In certain parts of the world, such as the Persian Gulf and the Caribbean Sea, successfully producing wells have been drilled under the sea without any direct contact with the land.

When oil has been struck the pressure below ground will generally cause the P. to flow to the surface at first, but as it is drawn off pumping usually becomes necessary. The P. is then piped, often over great distances, to storage to await refining or, if no local refining facilities are available, to a water terminal where it may be loaded on to tankers for transportation to distant refineries.

Crude P. varies not only in texture and thickness, but also in colour and smell. In colour it ranges from green or yellow

to brown or black, while it may have an acid, unpleasant smell or be practically odourless. Crudes usually contain hydrocarbons of 3 main types, namely paraffins, naphthenes, and aromatics. In addition to any or all of these there may be present small quantities of impurities such as compounds containing oxygen, nitrogen,

Middle E. Nevertheless the U.S.A. still has the largest production of any individual country. Total world production of P. rose from 280,500,000 tons in 1938 to about 795,000,000 tons in 1955. Comparative figures for the main producing countries in these 2 years are given below (in thousands of metric tons).

	1938	1955
U.S.A. . . . .	170,700	362,700
Venezuela . . . . .	28,100	113,200
U.S.S.R. (estimated) . . . . .	30,100	70,000
Kuwait . . . . .	—	54,800
Saudi Arabia . . . . .	100	47,500
Iraq . . . . .	4,400	33,700
Canada . . . . .	900	17,600
Iran . . . . .	10,400	16,200
Mexico . . . . .	5,500	12,900
Indonesia . . . . .	7,400	11,700

chlorine, and especially sulphur, from which crude P. derives its characteristic smell. According to the relative proportions of different types of hydrocarbons which it contains, a crude is described as paraffinic, naphthenic, or aromatic. Although P.s with differently composed hydrocarbon contents can often be found within the same region, sometimes even within the same oilfield, one type will usually be characteristic of a certain locality. Pennsylvanian crude is a noteworthy example of the many varieties with a high paraffin content. Naphthenic crudes are found in the Caucasian region of the U.S.S.R., notably at Baku. Naphthenic P.s are also referred to as 'asphalt-base' P.s, since their residue after distillation is largely composed of complex asphalts. Borneo is significant as a region rich in highly aromatic crudes. Important factors in the description of a P. are density, viscosity, surface tension, specific heat, vapour pressure, flash point, colour, refractive index, optical activity, and heat of combustion. Few types of crude P. can be used without first being submitted to various refining processes (see CRACKING OF PETROLEUM and PETROLEUM REFINING.) The P. leaves the refinery in a number of different forms. The main demand for P. products is as fuels. These include various grades of gasoline (see PETROL) for motor-cars and aircraft; kerosene, used as an illuminant; and as fuel for tractors and jet aircraft; diesel oil for the propulsion of motor ships and vehicles; propane and butane (gaseous fuels usually refrigerated and marketed in liquid form); and fuel oil for heating purposes. Other products include lubricating oils and greases; bitumen for road surfacing and building construction; paraffin waxes for the manuf. of candles, etc.; white spirit, used in paint manuf., and other industrial spirits; and numerous chemical compounds, the range of which has been referred to above. For many years the U.S.A. was the producer of by far the greater part of the world's P. supplies. In the years leading up to the Second World War large oilfields with low production costs were developed in the

Apart from the U.S.S.R. the largest producer among European countries is Rumania, with an estimated output of 8,000,000 tons in 1955. Production in the U.K. is negligible, but oil is worked in commercial quantities near Raking in Notts, and other sites have been developed. There is also a cent.-old shale oil industry in Scotland, where oil is extracted from shale after the rock has been brought to the surface (see SHALE OIL).

An intensive search for fresh reserves of oil is maintained all over the world. At the end of 1955 the total known reserves amounted to some 26,000,000,000 tons, of which two-thirds were located in the Middle E. See also ASPHALT; FLASH POINT; PETROL. See The Shell Petroleum Co. Ltd, *The Petroleum Handbook*, 1931, 1948; L. Gurwitsch and H. Moore, *The Scientific Principles of Petroleum Technology*, 1932; P. H. Frankel, *Essentials of the Petroleum Industry*, 1946; W. E. Pratt and D. Good (ed.), *World Geography of Petroleum*, 1950; E. N. Tirasoo, *Petroleum Geology*, 1951; *British Industries: Oil*, 1953; Institute of Petroleum, London, *Modern Petroleum Technology* (2nd ed.), 1954; J. H. van der Have and C. G. Verver, *Petroleum and its Products*, 1957.

**Petroleum Acts.** Legislation on the subject of petroleum falls broadly into 2 categories: laws relating to the safety measures to be observed in the storage, carriage, and use of petroleum, and those concerned with ownership of petroleum resources and their exploitation.

The earliest statutes dealing specifically with petroleum date from the 1870's and were concerned with safety precautions and the issue of licences for keeping quantities of inflammable spirit. Existing legislation was consolidated by the Petroleum (Consolidation) Act, 1928, which contains a number of provisions concerning the conveyance of petroleum spirit, and gives the minister concerned wide supervisory powers, including the right to make regulations and to institute inquiries where death or injury occurs as the result of petroleum explosions or fires. Under the Act petroleum spirit is not to be kept without a licence, the

appropriate licensing authorities being the dist. councils. Special provisions are laid down for the labelling of vessels for storing petroleum. Harbour authorities and canal companies are enjoined to make by-laws relating to the carriage of petroleum within their jurisdiction, and masters of vessels carrying the spirit must give due notice before entering harbour. The Petroleum Act provides that courts of summary jurisdiction may issue warrants for search or seizure where infringements of the Act are involved, and defines the powers of such inspectors as may be appointed by the minister under the Act. Notice of accidents involving licensed premises and of coroners' inquests held as a result of petroleum fires are to be given to the minister. Schedules to the Act provide licensing authorities with guidance in the matter of licence fees, and in regard to methods and apparatus for testing spirit for flash point, etc.

Legislation with regard to the production of petroleum in Great Britain was enacted in 1907 and 1918. The Petroleum (Production) Act, 1934, consolidates these enactments. The property in petroleum found in Great Britain is vested in the Crown. Licences to search for and produce petroleum and natural gas may be issued by the appropriate minister. The Act provides for certain powers of compulsory acquisition of land necessary for the implementation of a licence. The minister is empowered to make regulations in respect of licences and to inspect plans for proposed workings. By the Ministry of Fuel and Power Act, 1945, ministerial responsibility for matters relating to petroleum was transferred from the president of the Board of Trade to the minister of fuel and power.

**Petroleum Refining.** Crude petroleum is rarely suitable for immediate use as a fuel. Certain types found in Borneo and Texas have been used as boiler fuel and even in tractor engines, but in order to obtain the most efficient product for any purpose, it is necessary to refine the crude obtained from the earth. The exact composition of mineral oil varies from place to place (see PETROLEUM), and refinery processes have to be adapted to suit the various raw materials. The primary process of fractional distillation, however, is invariably applied.

The hydrocarbons of which crude petroleum is composed boil at different temps. On boiling they gasify, just as water turns into steam, and on cooling below their boiling point revert to their liquid state. Fractional distillation separates the components (or fractions, as they are called) of the crude into hydrocarbons of various boiling-point ranges. Crude petroleum is heated to a temp. of, say, 300° C. and is pumped, mostly in the form of vapour, into a fractionating column, a tall cylindrical metal tower, divided into compartments by a series of horizontal trays. As the mixture of vapours rises through the tower it passes through compartments gradually decreasing in temp. As they reach temps. slightly below their own boiling points the

various vaporised fractions condense into the trays and leave the column. In this way the least volatile (heavy) vaporised fractions leave the column in the form of gas oil or diesel oil only a little above the vapour intake. Kerosene and white spirit condense higher up the column, and the lightest fractions, including gasoline, propane, and butane, together with the small amounts of natural gas generally found dissolved in crude petroleum leave the top of the column still in gaseous form. These light products are then



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ZUBAIR DEGASSING STATION

passed through a condenser and gas separator, and the resultant 'straights run' gasoline is fed back to the upper trays of the fractionating column to assist in controlling the temp. The lower condensation products are reheated in 'strippers' after leaving the column, and any lighter fractions which have been condensed too soon are fed back as vapour. In the column the process of condensation is assisted by the use of 'bubble-caps' in the floors of the compartments. These force the rising gases to bubble through the liquid which has collected on the trays. The least volatile material, which has not vaporised on being pumped in, falls to the bottom of the column, where it is reboiled to ensure that it contains no volatile material. It is then pumped away as heavy fuel and used either for blending into fuel oil, or as a feedstock for other refining processes.

The essence of the distillation process is that, unlike 'cracking', it does not subject the petroleum hydrocarbons to any chemical change. The heavy fuel residue from primary distillation has so high a boiling point that chemical decomposition occurs if it is vaporised by boiling in the ordinary way. The boiling point, however, decreases with reduction in pressure below the normal atmospheric level. The heavy fuel is accordingly distilled in a similar plant in which the material is maintained under low pressure conditions by means of steam ejectors or vacuum pumps. The products obtained from this so-called vacuum distillation include gas oil, used as feedstock for cracking plant, fractions from which lubricating oils may be manuf., and bitumen as a heavy residue.

The various distillation products seldom correspond exactly with market requirements, and distillates usually need to be blended with other petroleum products before a marketable grade is obtained. In order to use up unwanted distillation products and to produce suitable blending components, modern refineries employ various 'cracking' processes (see CRACKING OF PETROLEUM) by which the chemical composition of the hydrocarbons in the feedstocks is changed. Other processes involving chemical change, in which smaller molecules are combined to build up more complex compounds (the reverse, as it were, of cracking), are polymerisation, alkylation, and isomerisation. Other refinery processes which play an important part in the production of marketable fuels include the extraction of impurities such as sulphur compounds (especially undesirable in aviation gasolines). Other components which may be found undesirable are aromatics (in kerosine illuminants) and petroleum waxes (in lubricating oils). All these undesirable materials may be removed by the use of appropriate solvents.

It is important that the world should be able to refine all the crude petroleum it produces. At the end of 1955 it was estimated that the total refining capacity of all countries was approximately 874,000,000 tons of crude per year. The U.S.A. had the greatest individual refining capacity of some 420,000,000 tons. Other important refining countries are the Soviet group, Curaçao, Canada, the U.K., and France. U.K. refineries at the end of 1955 had an ann. capacity of 29,700,000 tons.

**Petrology, Petrography, or Lithology**, science or study of the rocks, is concerned with their chemical and mineralogical composition, their macroscopic and microscopic structure, and their systematic classification. In the field the geologist can determine the mode of occurrence of a rock and learn something of its character with a pocket lens and some simple chemical tests. In the laboratory, by means of sp. gr. determinations and the use of the blowpipe, the value of metalliferous rocks can be quickly estimated. By chemical analysis a more exact estimation of the composition of the rock

can be made, and from a knowledge of its bulk composition it can be suitably classified. The examination of thin slices of rocks under the microscope is one of the most important of petrographic methods. Rock sections can be made which are less than  $\frac{1}{500}$  in. thick. Mounted

on thin glass slides (with a medium such as Canada balsam), these rock sections are examined under a microscope fitted with polarising and analysing prisms. The mineralogical constitution of the rock can then be determined the constituent minerals being distinguished by their appearance under ordinary and polarised light, their refractive index, pleochroism, birefringence, and crystalline form, etc. As well as observing the minerals of the rock in their microscope sections, by the use of liquids of varying densities, the minerals can be separated and obtained pure from the crushed rock. This method is dependent on the characteristic sp. grs. of the sev. minerals.

The rocks of the earth's crust are classified as sedimentary, igneous, and metamorphic. The first type are rocks which have been formed on the earth's surface by the accumulation of detritus and fragmental volcanic material, by organic agency, or by chemical action and the evaporation of saline solutions. This last includes the secondary cementing of fragmental rocks, and the deposits of rock salt, gypsum, etc. As a group the sedimentary rocks show a stratified, bedded, or laminated appearance, and, except in some chemical and organic deposits, a fragmental or 'clastic' structure. It is in these rocks too that fossil remains are to be found. These stratified rocks are treated petrologically under four groups: (1) Coarser detrital deposits ('arenaceous'), forming sandstones, quartzites, etc.; (2) The finer detrital deposits or 'argillaceous' rocks (clay, slate, marl, etc.); (3) The 'calcareous' rocks, consisting of carbonate of lime (limestone); (4) 'Pyroclastic' rocks, consisting of fragmental volcanic material (tuffs and halleflintas). Coal, peat, and lignite are of organic origin.

Igneous rocks, formed by the consolidation of molten magmas, are generally vitreous or crystalline, and differ from one another in character, according to the composition of the magma and to the conditions of consolidation. The composition of the rock is indicated by the essential minerals, although, under different conditions of solidification, magmas of similar composition may give rise to different mineral aggregates. In any genetic classification, however, the essential minerals necessarily are important.

The two prin. groups of igneous rocks are the extrusive rocks formed by the outpouring of magma at the earth's surface through volcanic vents and fissures, and the intrusive rocks formed by consolidation of the molten material in cavities and fractures within the earth. Both extrusive and intrusive rocks have a great range of composition, ranging from acid (silica-rich) types through

intermediate to basic and ultrabasic types poor in silica and rich in iron and magnesium.

Metamorphic rocks are those formed by the alteration of pre-existing rocks (either sedimentary or igneous) under the influence of heat, pressure, or percolating solutions. *See also* IGNEOUS ROCKS AND METAMORPHISM.

*See* F. H. Hatch, *Textbook of Petrology*, 1902; A. Holmes, *Petrographical Methods and Calculations*, 1921; N. L. Bowen, *The Evolution of the Igneous Rocks*, 1928; F. F. Grout, *Petrography and Petrology*, 1932; P. G. H. Boswell, *On the Mineralogy of Sedimentary Rocks*, 1933; F. H. Hatch, and A. K. Wells, *Petrology of the Igneous Rocks*, 1937; F. H. Hatch and R. H. Rastall, *Petrology of the Sedimentary Rocks*, 1938; A. Harker, *Metamorphism*, 1939; and W. H. Twenhofel and S. A. Tyler, *Methods of Study of Sediments*, 1941.

**Petromyzon**, *see* LAMPREY.

**Petronius**, Gaius, companion of Nero, under whom he was considered the leader of fashion (*elegantiae arbiter*). The influence which P. thus acquired excited the jealousy of Tigellinus (q.v.), and being accused of treason he put an end to his life by opening his veins (Tacitus, *Annals*, xvi. 18, 19). He is said to have dispatched in his last moments a letter to the prince, taunting him with his brutal excesses. It is generally agreed that he is the author of the work, portions of which have come down to us, bearing the title *Petronii Arbitri Satyricon*. A sort of comic romance, often licentious, but frequently keen in its satire, it contains the most interesting specimens of contemporary Latin slang, which are surpassed only by the *graffiti* discovered at Pompeii. The best ed. is that by W. D. Lowe (1905), with useful notes and a trans. in Eng. prose. There is also a text and trans. by M. Heseltine, 1913.

**Petropavlovsk**: 1. Tn in the N. Kazakhstan oblast of the Kazakh S.S.R., on the Trans-Siberian Railway, 170 m. W. of Omsk. Formerly a caravan centre, it has meat-packing, tanning, and agric. machinery industries. Pop. 120,000.

2. Tn on the E. shore of Kamchatka peninsula in the Russian Far East, cap., economic, and cultural centre of Kamchatka Oblast. It is an important fishing port. Founded 1740 by Bering as administrative, naval, and trading base. Bombarded and seized by allies 1854. Pop. (1956) 58,000 (7500 in 1934) Russian.

**Petrópolis**, tn and summer cap. of Rio de Janeiro, Brazil, in the beautiful Serra da Estrêla, 28 m. N. of Rio de Janeiro. It was the cap. of the state from 1894 to 1903, and houses the Imperial Museum. It manufs. silk, cotton goods, and cigars. The hotel Quitandinha is among the most expensive ever built. An inter-Am. defence conference was held in P. in 1947. Pop. 62,000.

**Petrov Affair**. On 13 April 1954, Menzies (q.v.) announced that Vladimir Petrov, third secretary at the Soviet Embassy in Canberra, had asked for and been granted political asylum. Six days later Petrov's wife left Sydney by air with

a Soviet escort, on her way to Moscow, but at Darwin she asked for, and was given, political asylum. The Soviet Gov. then broke off diplomatic relations with Australia. Petrov's allegations of a spy-ring involving Australian citizens led to the setting up of a Royal Commission to investigate the matter. Evatt (q.v.) was counsel for some of those indicted by Petrov; but in Sept. 1954 the Commission withdrew its permission for him to appear as such, stating that his obligations as counsel conflicted with his duties as Opposition leader. Evatt's conduct over the P. A. cost him the support of many members of his party, especially of the 'Catholic wing,' and touched off a campaign to depose him from the Labour leadership. This continued intermittently, but unsuccessfully, through 1955 and 1956, seriously weakening the party. Petrov's disclosures in 1955 about Burgess and Maclean led to the issue of a Brit. Gov. White Paper on the subject (*see* BURGESS and MACLEAN CASE). *See* Vladimir and Evdokia Petrov, *Empire of Fear*, 1956.

**Petrovgrad**, *see* ZRENJANIN.

**Petrović Niegos**, *see* DANILO I.

**Petrovsk**, *see* MAKHACHKALA.

**Petrovsk-Port**, *see* MAKHACHKALA.

**Petrozavodsk**, tn in NW. Russia, on the Onega Lake, 190 m. NE. of Leningrad, cap., economic, and cultural centre of Karelian Autonomous Rep. (q.v.). It has engineering works (timber industry equipment). There is a branch of the U.S.S.R. Academy of Sciences and a univ. (founded 1940). Pop. (1956) 118,000 (1926, 27,000, 1939, 70,000). Founded 1703 as a cannon foundry, tn 1777.

**Petrucchi, Pandolfo**, *see* SIENA.

**Petrus Damiani, St**, *see* PETER DAMIAN, St.

**Petrus Lombardus**, *see* LOMBARD, PETER.

**Petsamo**, *see* PECHENGA.

**Petticoat Lane**, former name for Middlesex Street, which runs N. from Aldgate High Street, in the bor. of Stepney, London. Originally called Hog Lane, it was settled by Huguenot silk weavers at the same time as Spitalfields (q.v.) near by. Later it passed through a period of squalor and crime, but since Jewish immigration into Whitechapel has been noted for the Sunday-morning clothes and general market. The name P. L. was officially discontinued c. 1830, but is still popularly used.

**Pettie, John** (1839-93), subject painter, b. E. Linton, East Lothian. He shared a studio with Orchardson (q.v.) for a time, and was elected R.A. in 1874. His colour schemes are effective and his figures well handled. His works include 'The Drumhead Court-martial,' 1865; 'The Body Guard,' 'An Arrest for Witchcraft,' 1866; 'A Challenge,' 'A Death-Warrant,' 1879; 'The Vigil,' 1884; 'The Chieftain's Candlesticks,' 1886; 'Two Strings to her Bow,' 1887. *See* life by M. Hardie, 1908.

**Pettigo**, vil. of co. Donegal, Rep. of Ireland, 17 m. E. of Ballyshannon, centre for Lough Derg (q.v.), 4½ m. Pop. 400.

**Petty, William**, *see* LANSDOWNE, FIRST MARQUESS OF.

**Petty, Sir William** (1623-87), statistician and political economist, *b.* Romsey, Hants. He studied at Leyden and Paris and later taught anatomy and chemistry at Oxford. He supervised the redistribution of forfeited lands in Ireland for the Commonwealth and was made surveyor-general there after the Restoration. From 1680 he devoted his time to statistical studies, and was one of the founders of the Royal Society. *See* C. H. Hull (ed.), *Economic Writings of Sir W. Petty*, 1899; and Marquess of Lansdowne (ed.), *Correspondence*, 1928.

**Petty Bag Office**, defunct office of the old court of chancery (*see* CHANCERY), the clerk of which had the duties of drafting parl. writs of *scire facias* (q.v.), *conge d'élire* for bishoprics, and, indeed, all original writs passing under the great seal and commissions of sewers, lunacy, and the like. Some of these writs, says Stephen, were originally kept in a *hamper* (whence the name 'hamper office') in contradistinction to those which were kept in a little sack or bag (whence the name P. B. O.); the hamper contained writs and returns relating to the business of the subject, while the bag contained those in which the crown was mediately or immediately concerned. All the duties formerly belonging to the clerk of the P. B. O. with respect to writs and letters patent are now, by the Great Seal Offices Act, 1874, vested in an official called the clerk of the crown in chancery or his officers; while the other duties appertaining to that office, e.g. enrolment, sealing, and issuing of documents and writs, and other matters relating purely to the administration of justice, are now performed by the senior clerk of the crown office dept. of the central office of the high court. *See* Halsbury's *Laws of England*.

**Petty-Fitzmaurice**, **Henry**, **Henry Charles Keith**, and **William**, *see* LANSDOWNE, third, fifth, and first MARQUESS OF.

**Petty Officers** in the R.N. are analogous to the non-commissioned officers in the army, a chief petty officer ranking with a sergeant-major and a petty officer with a sergeant. In the executive and engineering branches they rise through the ranks by merit and examination, and are responsible to their superior officers for the proper care of sev. portions of the ship, of groups of men and machinery. All artisan ratings automatically acquire the rate of petty officer as soon as they are qualified in their particular sphere.

**Petty Sessions**, *see* SESSIONS OF THE PEACE.

**Petunia** (from *petun*, Brazilian name for tobacco, to which plant the P. is allied), genus of ann. or perennial herbs (family Solanaceae), with attractive funnel-shaped flowers of a great variety of colours. They are specially valuable in hot, dry beds and borders.

**Petunies** or **China-stone**, the fusible feldspathic material mixed with kaolin in manuf. of hard-paste porcelain (q.v.).

The word means 'little bricks,' given to the material because it is sent to the potter from the quarry in this form.

**Pétursson, Hallgrímur** (1614-74), Icelandic poet, one of the greatest hymn writers of Christendom. There are 2 incomplete Eng. translations of his (50) *Passion Hymns*, the crown and the glory of Icelandic religious literature, and a number of trans. of his great funeral hymn, which since 1662 has been sung at every Icelandic funeral. *See* Arne Möller, *Hallgrímur Pétursson's Passionsalmer* (in Danish).

**Pétursson, Sigurdur** (1759-1827), Icelandic judge and poet, the first notable Icelandic playwright, a humorist at a time when few of his countrymen wrote in that vein.

**Petworth** (anct. *Peteorde*), par. of Sussex, England, 9½ m. WNW. of Arundel. P. House, associated with the families of Percy, Seymour, and Wyndham, was rebuilt between 1686 and 1696; it has one of the best private collections of pictures in England, including 20 of Van Dyck's portraits, and some excellent carving by Grinling Gibbons. In 1947 it was acquired by the National Trust from the third Lord Leconfield. Pop. (1931) 2500.

**Peucedanum**, family Umbelliferae, genus of herbs, perennial, ann., or biennial. *P.* (formerly *Anethum graveolens* is the common dill, an annual, native to Europe, known to Hippocrates and Dioscorides as a herb. *P. sativum* is the parsnip, cultivated for its root.

**Peutinger Map**, medieval copy of a Rom. road map made in the latter half of the 4th cent. AD, which was in the library of Conrad Peutinger, a scholar and antiquary of Augsburg, upon his death in 1547. It is now in the National Library, Vienna. The map, which is more strictly a diagram of road routes, covers the Rom. Empire from Spain and Britain in the W. to India in the E. The Brit. portion is largely incomplete, but it is important as the earliest known map of Rom. Britain. It is thought that the map was brought to Europe from a monastery in Jerusalem, and that it was copied from the original in the 13th cent.

**Pevensey**, par. and vil. of Sussex, England, on the Eng. Channel, 6 m. NNE. of Eastbourne. P. Castle contains 3 fortresses: the Rom. fortress of *Andarida*, a stone keep built by Robert of Mortain, and a fort round the keep built in the 13th cent. The Rom. portion, a fort of the Saxon shore, was built in the second half of the 3rd cent. and garrisoned until the end of the 4th cent. P. was the landing-place of William the Conqueror, 1066. It is a corporate member of the Cinque port of Hastings. Pop. 800.

**Peveril**, or **Peak Castle**, *see* CASTLETON. Pews, enclosed seats in churches. Though by no means general, church seats were in use in England some time before the Reformation, as is proved by records as old as 1450 speaking of such seats by the name of *pups*. They were originally plain fixed benches, all facing E., with partitions of wainscoting about

3 ft high, and sides of the width of the seat, panelled or carved, the sides sometimes rising above the wainscoting and ending in finials or poppies, or else ranging with it and finished with a moulding. After the Reformation, P. grew into large and high enclosures, each containing several seats, lined with baize, and fitted with doors, desks, and cushions. By the law of P. in England, all church seats are at the disposal of the bishop. It appears that by common law every parishioner has a right to a seat in the church, and the churchwardens are bound to place each one as best they can. The renting of P. has now become less common.

**Pewsey**, tn. of Wilts, England, and the centre of the fertile Vale of P. and of the 'mother' of W.-country carnivals, held each year during the third week of Sept. Pop. 2250.

**Pewter**, alloy in which tin is always the main constituent and lead usually the other, though various other metals have been used as secondary ingredients. P. was formerly used for making drinking-vessels, plates, etc. The oldest known is Rom., but Eng. P. from medieval times until the 18th cent. was a superior product and is still favoured by collectors. According to law it must not contain any free lead (to avoid lead poisoning), which is easily soluble in acid liquors. The cutecitic proportion of tin is therefore the minimum, i.e. 67 per cent. In France vessels containing over 18 per cent of lead may be confiscated. See M. Bell, *Old Pewter*, 1906; C. A. Markham, *Pewter Marks and Old Pewter Ware*, 1909; H. J. L. Masse, *Pewter Plate* (2nd ed.), 1910; H. Jenkins, *The Pewter Collector*, 1921; and H. H. Cottrell, *Old Pewter: its Makers and Marks*, 1929.

**Peziza**, a genus of cup fungi, class Ascomycetes, about 50 species, usually found in clusters on decaying wood or organic matter.

**Pezza, Michele**, see DIAVOLO, FRA.

**Pfalz**, see PALATINATE.

**Pfalzburg**, see PFALSBURG.

**Pfennig**, Ger. coin, since 1871, representing the one-hundredth part of a mark. Before the First World War 1- and 2-P. copper coins were current; in 1915 iron pieces of 5 and 10 P.s were issued; in 1916 aluminium pieces of 1 and 50 P.s were coined, and later even zinc coins of 10 P.s. Thereafter nickel coins were issued.

**Pfitzner, Hans** (1869-1949), Ger. composer, b. Moscow, studied at Hoch's Conservatory at Frankfurt on Main, and after various teaching and conducting posts became prof. at Stern's Conservatory in Berlin in 1897. His output, especially of songs (106), is large, and includes choral works, orchestral music, several concertos, and chamber music; but he made his mark especially with 5 operas, one of which, *Palestrina*, produced in 1917, has kept the Ger. stage.

**Pfornheim**, Ger. tn in the Land of Baden-Württemberg (q.v.), on the Enz, 23 m. WNW. of Stuttgart (q.v.). It lies on the N. border of the Black Forest (q.v.), and is an important centre of road and rail communications. There is an

11th-cent. church and another which is partly 13th cent. The tn has important jewellery and watch-making industries, and has a goldsmiths' training school. Pop. 66,000.

**Phaeacians**, or **Phaeacae**, according to *Odyssey* vi-viii dwell on the is. of Scheria (Corcyra or Corfu?). They were visited by Odysseus on his return from Troy to Ithaca. The Cyclopes had driven them from Hyperia their first home. Alcinous, father of Nausicaa, was their ruler. They lived in undisturbed happiness and peace, had ships that needed no human guidance, but became types of gluttony and luxury. See A. C. Merriam, *Phaeacians of Homer*, 1880; L. Cottrell, *The Bull of Minos*, 1955.

**Phaedon**, or **Phaedo**, Gk philosopher of the 4th cent. BC, a disciple of Socrates; b. Elis. Taken to Athens as a prisoner of war (c. 400 BC), he became intimate with Socrates, who procured his release. He was present at the death of Socrates, as related in Plato's famous dialogue called by his name. After this he returned to Elis and founded the Elian school, later merged in the Eretrian.

**Phaedra**, see HIPPOLYTUS.

**Phaedrus**, Athenian of the 4th cent. BC. He was a friend of Plato, one of whose most famous dialogues is named after him and contains a noble passage on the Forms as objects of mystical contemplation.

**Phaedrus**, Rom. fabulist of the 1st cent. AD, originally a Macedonian slave, perhaps liberated by Augustus. Under Tiberius he suffered from the hostility of Sejanus, but lived to see his overthrow (AD 31), and probably d. in Claudius's reign. The *Fabulae Aesopiae* in iambic verse ascribed to him were first pub. by Pithoens (1596). The latest edition is that by J. P. Postgate (1919). See R. Ellis, *The Fables of Phaedrus*, 1894.

**Phaestus**, ant. Cretan city 25 m. SW. of Candia. From 1900 excavations have revealed a magnificent palace, with a smaller one at Hagia Triada 2 m. distant.

**Phaëthon** (Greek for shining), son of Helios and Clymene. To prove his descent and gratify his ambition he persuaded his father to let him drive the chariot of the sun, but failing to control the fiery horses, he came too near the earth. Zeus killed him with a thunderbolt and hurled him into the Eridanus (Po). See G. Knaack, *Questiones Phaëthoneae*, 1885, and Bangert, *De Fabula Phaëthontea*, 1885.

**Phaeton**, most commonly an open 4-wheeled carriage drawn by 1 or 2 horses; there are varieties known as pony, mail, and spider P.s.

**Phagocytosis** (Greek *phagein*, to devour; *kutos*, cell) the process of ingestion of undesirable material by certain cells, the phagocytes. In the higher animals the majority of these cells are the white corpuscles, or leucocytes, in the blood. They resemble amoebae in their mode of movement and in their ability to ingest and digest many kinds of bacteria. On this account Metchnikov (q.v.) introduced the theory of P. to explain immunity

to disease. If the germs were rapidly ingested, disease might be prevented, and animals with active phagocytes would thus be naturally immune. If ingestion were slow, the disease would run its course, but might eventually be combated by P. Metchnikov distinguished 2 kinds of phagocytes, the small ones in the blood, and the larger ones in blood and in certain tissues such as endothelial cells and connective tissue. As a result of the research activated by his theory, phagocytes are now distinguished according to their function. Some ingest parasites; others flock to the surface of exposed wounds and help to form a protective covering; others force their way through the walls of capillaries in injured tissues, remove dead matter and injurious bacteria, and form the pus sometimes accompanying inflammation. Other phagocytes secrete products that kill the bacteria, while yet others may resorb the tissues of tumours, cysts, and of grafts. P. has been recognised in many animals. It was first observed by Metchnikov in the larvae of starfish and in the common water 'flea' (*Daphnia*). During metamorphosis the cells of tails of tadpoles first undergo dedifferentiation and are then removed by P. In sponges phagocytes ingest obstructing and injurious particles and eject them into the water currents.

**Phai-phô**, see FAIFO.

**Phalarocorax**, large, web-footed bird. See CORMORANT.

**Phalanger**, see CUSCUS.

**Phalanx**, name given to the formation of the heavy infantry of the anct Grecian armies. It consisted of a series of parallel columns of men standing close one behind the other, and capable of penetrating and resisting almost any other formation. The Spartan P. was the original of this formation, and consisted of soldiers standing from 4 to 8 men deep. The Macedonian P., the last of this formation, was 16 men deep. The soldiers were armed with swords and 13-ft pikes. They were flanked by light infantry and cavalry. The Romans defeated the P. by a combination of missile attacks and harassing tactics.

**Phalaris**, tyrant of Agrigento (Agrigento) in Sicily (c. 570-554 BC). He perished in an outbreak of popular fury roused by his monstrous cruelty. P. is celebrated for the brazen bull in which he is said to have burned his victims alive, and to have made the first experiment on its inventor, Perillus. The epistles bearing his name were shown by R. Bentley (*Dissertation*, 1699) to be forgeries of the 2nd cent. BC.

**Phalarope** (*Phalaropus*), genus of birds which includes 2 species that sometimes occur in Britain. The red-necked P. (*Lobipes lobatus*) breeds mostly in polar regions, and also in the Orkneys, Shetlands, Hebrides, and W. of Ireland. It is about the size of a sandpiper, and its winter plumage is leaden grey and white, ruddy patches appearing on the neck in summer. The grey P. (*P. fulicatus*) is rather larger.

**Phalerum**, in anct geography, a seaport of Attica, Greece, the port of Athens up to c. 475 BC, when the Piræus (q.v.) to the W. replaced it. It is on a bay 3½ m. S. of Athens, now frequented as a bathing-place.

**Phallus**, representation of the male generative organ, used at certain Dionysiac festivals in anct Greece, as a symbol of the powers of procreation, and an object of common worship in the nature-religion of the E. It had many names, e.g. Linga, Joni, Pollear, etc. The Phoenicians attributed its introduction into their worship to Adonis (see TAMMUZ), the Egyptians to Osiris, the Phrygians to Attya, the Greeks to Dionysus. The common myth concerned a god deprived of his virility, perhaps an allusion to the sun, which in autumn loses its fructifying influence. The procession in which it was carried about by Phallophoroi was called Phallagogia, or Periphallia, and the hymn sung called the *Phallikon Melos*. Aristotle traces the origin of comedy to the ribaldry and jokes at those festivals. Before the temple of Aphrodite at Hierapolis stood 2 phalli, 180 ft high, upon which a priest mounted annually to remain there in prayer for 7 days. The P. was an attribute of Pan, Priapus, Silenus, and Hermes, see HERMAE.

**Phalsbourg** (Ger. Pfalzburg), Fr. tn in the dept of Moselle, an anct fortress. Pop. 3100.

**Phanerogamia**, **Phanerogams**, or **Flowering Plants**, one of the great divisions of the vegetable kingdom, consisting of plants which have flowers with stamens and ovules, and after fertilisation, seeds containing an embryo; now called Spermatophytes (q.v.).

**Pharaoh**, Anglicised Hebrew form of the ordinary title of the Egyptian kings meaning 'Great House.'

**Pharisees** (Aramaic, *Perishin*, 'separated'), religious sect among the Jews, first heard of in the latter half of the 2nd cent. BC, but probably descended from the Chasidim or 'Pious' (Assideans), who passively resisted Antiochus Epiphanes at the beginning of the Maccabean revolt. The name was perhaps at first given them in derision, because of their exact observance of the Law, which distinguished them from the ordinary Jews, for many of whom it was an impossibility on account of their having a whole-time occupation. The Pharisaic scribes developed a minute casuistry to apply the Law to every detail of life, but in doing so, at the same time found ways of evading many grave moral obligations, for which Christ stigmatised them as hypocrites. At their best, however, they were inspired by a genuine spiritual ideal, though an impossible one for fallen man, to achieve perfection in God's service by obedience to a formal code. They accepted the doctrine of the Resurrection of the Body, a late development in Judaism, in which they were opposed to the conservative but sceptical and worldly Sadducees. They were opposed to the increasing secularism of the high-priesthood, and were characterised



by the stress they laid upon the eternal and unchanging nature of the law, and upon the separation between Israel and the Gentile races. They did much service to their people by their uncompromising patriotism and by their opposition to the liberal opinions of the Sadducees; but they rapidly became the slaves of formalism, and their very servitude rendered them overweening in their pride as the only observers of the law. See R. H. Charles, *Religious Development between the Old and the New Testaments*, 1914; and A. Deane, *The World Christ Knew*, 1944.

**Pharmaceutical Society of Great Britain**, was founded 1841 and granted Royal Charter of Incorporation 1843. Its constitution was revised by the granting of a Supplementary Charter, 1953, and the coming into operation of the Pharmacy Act, 1953. The objects of the Society under its charter are to advance chemistry and pharmacy; to promote pharmaceutical education and the application of pharmaceutical knowledge; to maintain the honour and to safeguard and to promote the interests of the members in their exercise of the promotion of pharmacy; and the provision of funds for benevolent purposes. Until 1933 membership of the Society was voluntary but restricted to persons registered as pharmacists. The Pharmacy and Poisons Act, 1933, ended the voluntary nature of the Society, and membership became an automatic consequence of registration as a pharmacist. The membership in 1956 was 26,000. The P. S. keeps the statutory Register of Pharmaceutical Chemists and the statutory Register of Pharmacies (approximately 15,300). It has the statutory duties of examining students and enforcing the various Pharmacy Acts governing the sale, distribution, disclosure of composition, and labelling of poisons and medicines. In 1842 it founded a school of pharmacy, which in 1948 became the School of Pharmacy of the University of London.

The P. S. has a library of approximately 28,000 volumes, together with a collection of about 6000 pamphlets, manuscripts, etc., and a museum of *materia medica* (q.v.) and historical material. It publishes the *Pharmaceutical Journal* (weekly), the *Journal of Pharmacy and Pharmacology* (monthly), the *British Pharmaceutical Abstract*, the *Extra Pharmacopoeia* (Martindale), the *British Veterinary Codex*, and, on behalf of the General Medical Council (q.v.), the *British Pharmacopoeia*. See also CHEMIST and DRUGGIST, or PHARMACIST.

**Pharmacist**, see CHEMIST AND DRUGGIST.

**Pharmacognosy**, or *Materia Medica*, knowledge of drugs, particularly as regards their origin and their condition in the unprepared state; *pharmacy* (q.v.) is the compounding and dispensing of drugs as medicines, whereas *pharmacology* (q.v.) is the scientific study of drugs and their mode of action. Formerly most drugs were obtained from natural sources, especially plants, as for instance digitalis

from the foxglove, ergot from a fungus which parasitises rye, and cocaine from the leaves of the coca plant. Nowadays many drugs are prepared synthetically, though natural products are still important. See T. I. Williams, *Drugs from Plants*, 1949.

**Pharmacology**, in its widest aspect, is the science concerned with change effected in the function of living material either by the direct action on it of chemical compounds or by their effect on its environment. P. is now generally restricted to the science dealing with the effect of drugs on man. The first treatise known on P. was that of Dioscorides (c. AD 60), and on it all subsequent pharmacopoeias have been founded. It was trans. and extended by the Arabs and Persians, who were the authorities on P. in the Middle Ages, and who made some attempts at classification according to the action of the drug. Little advance in P. was made in Great Britain until the 17th cent., when a series of pamphlets was pub. describing the action of drugs from America and the Far E. Amongst the drugs described were ginseng, salap, and ipecacuanha. In the 18th cent. Anton Stoerck of Swabia investigated and advocated the use of emetics and certain alkaloids; Purkinje experimented on himself to test camphor, belladonna, stramonium, and turpentine; François Magendie (1783-1855) made medical use of compounds of bromide, iodine, and of morphine, strychnine, and other alkaloids. The 19th and 20th cents. have witnessed the discovery of new drugs and the sifting of old ones. Many have been removed from the pharmacopoeias as a result of the critical tests made to determine their efficacy. In Germany, U.S.A., and England numerous experiments have been made to discover the effect of various drugs on animals and the maximal and minimal doses. This work has yielded valuable information, but the results must be used with caution, for the effect of a drug on man may be very different from its effect on other animals. The action of drugs on the endocrine organs has been fully investigated.

Since rational treatment of disease must depend on knowledge both of the disease and of the drug and its action, P. is dependent on pathology, chem., and physiology (q.v.). Investigation of the action of drugs is made difficult by the fact that drugs acting in very different ways may apparently produce the same effect. The heart, for example, may be accelerated either by drugs paralysing the vagus nerve fibres or by drugs exciting the sympathetic fibres. Difficulties arise also in connection with the classification of drugs. That at present adopted is based on both chemical and physiological considerations, for attempts to use either separately, or to use a botanical classification, result in grouping together drugs either of different constitution or of different action, or both. The method of administration of the drug and the size of the dose are also included in the study of P. See MEDICINE; MATERIA

**MEDICA; PENTICILLIN; PALUDRINE; SULPHONAMIDES.** See W. E. Dixon and W. A. M. Smart, *Manual of Pharmacology*, 1936; J. A. Gunn, *Introduction to Pharmacology and Therapeutics*, 1956; C. Solomon, *Pharmacology, Materia Medica and Therapeutics*, 1952; and F. K. Oldham, F. E. Kelsey and E. M. Gelling, *Essentials of Pharmacology*, 1955; *The Extra Pharmacopoeia* (Martindale) (24th ed.), 1958.

**Pharmacopoeia**, book containing formulae for the preparation of compound medicines, especially such a book recognised as a standard. Hist. does not definitely record when the first P. was pub. The first ed. of the Chinese *Materia Medica* is said to have been prepared about 2000 BC by the emperor Shen Nung. The Ebers papyrus was written some 1500 years later. Books on *materia medica* were produced by Theophrastus (380-286 BC), Scribonius Largus (AD 45), Dioscorides (c. AD 60), Galen (AD 130-200), and others. Some authorities aver that the first real P. was the *Nuovo receptario composito*, which was made official in Florence at the close of the 15th cent., or the work prepared by Valerius Cordus which was adopted officially by Nuremberg (in 1546), or that prepared by Adolph Occo in 1564, which was actually called a P. and made official in Augsburg in 1613. But these books were only 'official' in small ters. The Royal College of Physicians was the first body to prepare a P. which became official throughout the whole country. The project was first discussed in 1585 and, after considerable discussion, the first issue of the P. was produced in May 1618. Only 2 copies of this issue are known to exist. This was the first *London Pharmacopoeia*, and the colleges at Edinburgh and Dublin issued similar works, revised periodically, commencing in 1699 and 1807 respectively. The disadvantages and dangers of 2 separate authorities with different names and different standards of strength for their preparations led Parliament to provide, by the Medical Act, 1858, for the pub. of the *British Pharmacopoeia* (new edition, 1958). National P.s are pub. in many countries, of which *The United States Pharmacopoeia*, revised every 10 years, and the *Fr. Codex* are the most widely used.

**Pharmacy** deals with the sources, preparation, and dispensing of medicines. Persons desiring to practise P. or to use the title chemist or druggist in conjunction with retail business must be registered under the Pharmacy Acts, having passed the examination and satisfied the other conditions of the Pharmaceutical Society (q.v.).

**Pharnabazus**, satrap of the Persian provs. bordering the Hellespont, who played a prominent part in Gk hist. from 412 to 393 BC. He was a loyal friend to Sparta.

**Pharaces:** 1. King of Pontus (c. 185-169 BC), grandfather of Mithradates the Great.

2. King of Pontus, or more properly of

Bosporus; son of Mithradates the Great, whom he compelled to put an end to his life in 63 BC. In the civil war he allied himself with Pompey, but was defeated by Caesar at Zela (47). Later in the same year P. was assassinated by one of his officers.

**Pharos**, see HVAR.

**Pharos:** 1. A peninsula, formerly an is. off the N. coast of Egypt. On founding Alexandria, Alexander joined it to the mainland by a mole.



DOVER PHAROS

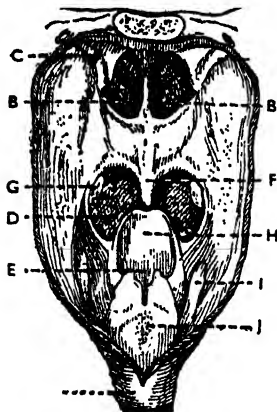
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2. A lighthouse, a meaning derived from the lofty tower erected by Ptolemy II on the is. of P., one of the 7 wonders of the anc't world. Ships were guided safely into harbour by the light of torches or fires shown from its upper windows. Another P. is that at Dover, one of the most striking monuments of Rom. Britain. With a second at Dover, and another on the cliffs near Boulogne, France, it fitted into a scheme for assisting the navigation of cross-Channel traffic. Possibly it was part of the estab. of the *Classis Britannica*, the Channel Fleet. See also LIGHTHOUSE.

**Pharsalus** (modern Pharsala), tn of anc't Thessaly, Greece, 24 m. SW. of Larissa. In the neighbouring plain of

Pharsalia Caesar won his famous victory over Pompey, 48 Bc.

**Pharynx**, cavity situated at the back of the nose and mouth and above the gullet. It therefore serves as a communication between nose and mouth and as part of the air and food. It extends from the base of the skull to the level of the sixth cervical vertebra, where it becomes continuous with the gullet. The interior of the cavity is lined with mucous membrane, which is lined with ciliated columnar epithelium in the naso-P., and stratified squamous epithelium in the



THE PHARYNX  
(opened from behind)

A, Oesophagus; B, posterior portion of nostrils; C, Eustachian tube; D, opening to mouth (base of tongue); E, superior opening of larynx; F, uvula; G, tonsil; H, epiglottis; I, thyroid cartilage; J, posterior surface of larynx.

oral P. Outside this is a layer of fibrous tissue, the *pharyngeal aponeurosis*, and outside this, again, is the muscular coat. The upper portion of the cavity or naso-P. belongs to the respiratory tract, and is joined to the lower portion, or bucco-P., which belongs to the digestive tract, by the pharyngeal isthmus. The P. communicates with the middle ear by means of the Eustachian tube, and by this means the middle ear can become infected from the P.

**Phase Advancers.** In a distribution network with a large load of induction motors or other induction apparatus, and in long transmission lines, the current-lag behind the voltage may lower the power factor (q.v.) to such an extent that the current supplied by the power station becomes excessive, and in the transmission lines the stability is endangered. It is then necessary to generate a certain

amount of reactive power with leading current—to advance the phase of the current. Over-excited synchronous motors running idle supply such leading current. Recently powerful batteries of static capacitors have been employed with success. Sometimes the authorities stipulate that consumers install capacitors in parallel with induction motors when the power factor is below a certain minimum.

**Phase-angle.** Consider 2 alternating quantities, like a.c. voltages or currents of the same frequency, as sinewaves, then a cycle corresponds to the value  $2\pi$  or the angle  $360^\circ$ . If one of the quantities is a fraction of a cycle behind the other, that fraction expressed in degrees is the P. or phase difference between the two quantities. See ALTERNATING CURRENT.

**Phase Diagrams,** see ALLOY; INDUCTION, MAGNETIC; METALLURGY (PHYSICAL METALLURGY); and TRIPLE POINT.

**Phase Modulation,** see MODULATION.

**Phaseolus**, a genus of twining ann. or perennial tropical or sub-tropical herbs, family Leguminosae, about 150 species; *P. coccineus* is the parent species of the Scarlet Runner Bean, *P. vulgaris* of the Fr. Beans; *P. lunatus*, the Sieva Bean, is widely grown in tropics; *P. caracalla*, the Snail Flower, is a tropical climber.

**Phases**, changes in the appearance of the moon and of a planet due to the illuminated part being observed from different angles. P. increase from the dichotomous to the gibbous state till, at opposition, the moon, or planet, is 'full,' when the process is reversed and the moon wanes to 'new.' The 2 inner planets, Mercury and Venus, exhibit P. similar to those of the moon. The P. of the latter can be seen with quite a small instrument, and it was their discovery by Galileo in 1610 that finally estab. the Copernican system. Of the exterior planets only Mars and a few minor planets show P., and these only gibbous.

**Phasianidae**, see PHEASANT.

**Phasis**, River, in anct Colchis, see RION. Phat-Diem, tn of Nam-dinh (q.v.) prov., Tonking; a Rom. Catholic bishopric, it is noted for its unique 19th-cent. cathedral. Previously the centre of a predominantly Rom. Catholic area of Tonking, it has now been abandoned by most of the Rom. Catholics, who fled to S. Viet Nam.

**Phazania**, see FEZZAN.

**Pheasant**, or *Phasianus*, genus of game birds which, according to modern ornithologists, contain 6 species: *P. colchicus*, *P. reevesii*, *P. ellioti*, *P. himala*, *P. mikado*, and *P. socmerringi*. The genus is distinguished by the very long wedge-shaped tail and the absence of a crest. *P. colchicus*, the common P., was introduced from S. Russia and Asia Minor into W. Europe by the Romans, but in the greater part of Europe a true, pure-bred common P. is rare or even non-existent, because of the introduction of other species with which it has freely interbred. Of *P. colchicus* at least 30 local races are known, including the large and desirable Mongolian P., with rich red flanks, green

gloss on the plumage, and a broad white ring round the neck; the ring-necked P. which, more than any, has hybridised with the common P. in Britain; and the Jap. P., distinguished by its dark green breast. The other P.s hybridise with the varieties of the common P., but the offspring is always infertile. Reeves's P. (*P. reevesii*), a native of China, is over 6 ft in length, and has yellow and brown spangled plumage. *P. mikado* was discovered in central Formosa in 1898; the male is ultramarine blue with a white barred tail. A number of members of other genera of the family Phasianidae are called P.s, including the golden P. (*Chrysolophus pictus*), Lady Amherst's P. (*C. amherstiae*), the pucras P.s, the kalege P.s, the eared P.s, and the impeyan P.s. The smallest member of the P. family is the *Ophrysia superciliosa*, the P.-quail, a native of Nepal.

**Pheasant-shooting in Great Britain.** The season for this sport begins on 1 Oct. and ends 31 Jan. Until the leaves have fallen in the covert, the birds are shot over pointers or setters on rough ground, or with spaniels in hedgerows and small plantations. From about the middle of Nov. battues are organised: the birds, which prefer to run on the ground rather than take to the air to escape danger, being driven to a point from which they are flushed, and exposed to the fire of a double line of guns. The shooter, who is provided with his own loader, kills cocks in preference to hens, and kills only those birds in front of him. As a rule coverts can only stand 3 battues. See W. B. Tegetmeier, *Pheasants*, 1897, and Hon. Walter Rothschild's article in the *Encyclopaedia of Sport*, 1897-8; also R. Fitzgerald, *British Game*, 1948.

**Pheasant's Eye** see ADONIS.

**Phedias**, or **Phidias** (c. 500—after 432 BC), sculptor of ancient Greece. He was the son of Charmides and was b. in Athens. He studied under the Argive Ageladas, or, according to another authority, under Hegias of Athens. Works which have been attributed to him are a colossal figure of Athena Promachos in bronze, the Lemnian Athena, a gilt Athena at Plataea, and the Zeus at Olympia. He had the opportunity of proving his genius when Pericles appointed him to superintend the adornment of Athens. P. planned the erection of temples and public buildings and, chief of all, the Propylaea and the Parthenon. Fragments of the frieze, metopes, and pediment of the Parthenon were brought to England by Lord Elgin, and are preserved under the title of the Elgin Marbles in the Brit. Museum. P. executed the statue of Athena in ivory and gold about 438 BC, and 6 years later was accused of implety in having introduced his own and Pericles's likeness on the shield of the goddess and of stealing the gold entrusted to him. He died either in prison or in exile. P. was regarded by ancient critics as the greatest of sculptors, and the impression of supreme eminence remains, although no single extant masterpiece can certainly be credited to him. See A. S. Murray,

*Greek Sculpture*, 1880; C. Waldstein, *On the Art of Phidias*, 1885; A. Hekler, *Die Kunst des Phedias*, 1924.

**Phedion**, King of Argos. His date is disputed, but the most probable opinion favours the first half of the 7th cent. BC. He introduced the so-called Aeginetan scale of weights and measures.

**Phellodendron**, an E. Asian genus of deciduous trees, family Rutaceae, 6 species, grown in gardens for their handsome foliage.

**Phellogen**, a cambium layer of cells, dividing in or just below the epidermis of dicotyledons to form cork. P. and its derivatives are termed the periderm. See CAMBIUM.

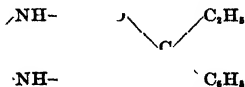
**Phelps, Samuel** (1804-78), actor-manager, b. Devonport. He made his debut at the Haymarket in London as Shylock (1837), and was engaged by Macready. From 1844 to 1862 he and Thomas Greenwood produced at Sadler's Wells, Clerkenwell, over 30 Shakespearean as well as other 'legitimate' plays, which had great influence in raising the taste of theatrical audiences. His chief parts were Lear, Macbeth, Othello, and Sir Giles Overreach, but he also excelled in the comic characters of Bottom, Falstaff, and Shallow. See life by May Phelps and J. Forbes-Robertson, 1886.

**Phelps, William Lyon** (1865-1943), Amer. scholar and critic, b. New Haven, Connecticut, son of a minister. Educ. at Yale and Harvard, in 1901 he became prof. of Eng. literature at Yale. A gifted and popular teacher, he was the first to give a course of lectures on contemporary writers at an Amer. univ. Among his works are *The Beginnings of the English Romantic Movement*, 1893, *Essays on Modern Novelists*, 1910, *The Advance of the English Novel*, 1916, *The Advance of English Poetry*, 1918, and *The Twentieth Century Theatre*, 1918. In 1939 he pub. his *Autobiography with Letters*.

**Phenacstin** ( $\text{CH}_3\text{CONH}\cdot\text{C}_6\text{H}_4\cdot\text{OC}_6\text{H}_5$ ), white crystalline substance obtained from para-aminodiphenol. It is soluble in alcohol and glycerine, but slightly soluble in water. It is used in medicine for neuralgia and headaches.

**Phenacodus**, genus of extinct ungulates in the order Condylarthra, found in the Eocene of America and Europe.

**Phenobarbitone** (phenobarbital, gardenal, luminal) is phenyl-ethyl-barbituric acid



i.e.  $\text{C}_{12}\text{H}_{11}\text{O}_4\text{N}_2$ . It is used extensively as a hypnotic (q.v.) and sedative and in the treatment of epilepsy, for its depressing action on the cortical activity of the brain. The dose is 1-2 gr. (30-120 mg.) by mouth or by subcutaneous injection. It has a more prolonged action than hexobarbitone (evipan), which is rapidly destroyed and excreted by the body. See also BARBITURATES.

**Phenocryst**, see PORPHYRY.

**Phenol**, see CARBOLIC ACID.

**Phenol-formaldehyde**, see PLASTICS.

**Phenolphthalein** ( $C_{20}H_{14}O_4$ ) is prepared by heating phthalic anhydride (3 parts) with phenol (4 parts) and a little strong sulphuric acid to  $115^{\circ}\text{C}$ . It is a white crystalline substance, slightly soluble in water, but dissolves readily in alcohol. It is used in volumetric analysis as an indicator for weak acids. With alkalis it gives a pink coloration, but the presence of acids destroys this coloration. P. is also used in medicine as a mild purgative.

**Phenomenology** is the science of phenomena in philosophy, involving a contention that the existence of 'substance' is an illusion, that matter is no more than an indeterminate and unknown something underlying phenomena. Phenomenalism originated in idealism (q.v.) and positivism (q.v.), and later developed into an attack upon the traditional doctrine of substance. Locke and Berkeley in a measure are phenomenologists, Berkeley holding that all objects of knowledge must be phases of mind arising from stages of perception, while Hume argued that if the supposed but unknown substantial substratum of external sense phenomena is illusory, so is the supposed substantial ego which is stated to underlie the internal phenomena of consciousness. Modern phenomenologists adhere to the theory that there is only one normally 'conscious personality.' The subconscious mental activities of an individual are put together and called the 'subliminal' or subconscious ego or self. In abnormal cases of 'double consciousness' the subliminal self struggles for mastery over the conscious self and is, for a time, successful. P. has a close connection with the science of psychology (q.v.), especially in its bearing upon the 'subliminal self.' Indeed, the connection is close enough to cause confusion between the two. In principle the 2 studies are dissimilar. Briefly P. tries to show that absolute knowledge as an expression of spiritual life is based upon experience, and is the final triumph, as it is the final cause, of the complete process of experience. By P., as may be gathered from the foregoing analysis, we generally understand the descriptive study of phenomena as they are immediately presented to experience. But P. may also be described as a philosophic method which makes use of descriptions which are phenomenological in the usual sense of the word, but which regards them only as a means of seeking something that lies beyond the phenomena. The chief exponent of the phenomenological movement in this later sense of the word was the Ger. philosopher Edmond Husserl (d. 1938), who taught at Freiburg Univ. The P. of Husserl is indeed a description of the immediate data of consciousness; but whereas ordinary academic psychology allows itself to be monopolised by the object, Husserl considers the thinking subject; his psychology is a reflexive psychology. It is the very 'structures' of conscious activity that he tries to discover, e.g. 'perception,' 'distant recollection,'

'exemplification by analogy.' These structures he calls essences. But there is a radical difference between Husserl and Plato: Husserl's essences do not exist in themselves, in a separate world, as ideal types of possible things; they are factual data resulting from the relationship between objects and consciousness. Other phenomenologists who, like Husserl, see consciousness as without content, are Heidegger (q.v.) and Sartre (q.v.). See G. Hegel, *Phenomenology* (trans.), 1910; P. Coffey, *Ontology*, 1914; K. Stavenhagen, *Absolute Stellungnahmen Erlanger*, 1925; J. Hering, *Phénoménologie et philosophie religieuse*, 1925; W. Reyer, *Einführung in die Phänomenologie*, 1926; and M. Farber, *The Foundation of Phenomenology*, 1943. See also G. Gurwitsch, *Les Tendances actuelles de la philosophie allemande*, 1930, and P. Foulquié, *Existentialism* (trans.), 1947.

**Phenomenon** (from Greek *phainomai*, I appear), that which appears as distinguished from that which exists. The term was once used to denote the world of sense as opposed to the world of reason, but Kant has given it a more extended connotation. In the *Critique of Pure Reason* he says: 'The undetermined object of an empirical intuition is called phenomenon. The empirical intuition is a mere phenomenon in which nothing that can appertain to a thing in itself, can be found. . . . In the whole range of the sensuous world, investigate as we may, we have to do with nothing but phenomena.' See NOUMENON; also H. Spencer, *First Principles*, 1862.

**Phenyl Carbinol**, see BENZYL ALCOHOL.

**Phenyl-methane**, see TOLUENE.

**Phenyl Methyl Ketone**, see ACETO-PHENONE.

**Phenylacrylic Acid**, see CINNAMIC.

**Pherecydes** 1. (fl. c. 544 BC), of Syros, Gk philosopher. Pythagoras is said to have learned from him the doctrine of metempsychosis or transmigration of souls.

2. Of Athens, one of the early Gk logographers, was a contemporary of Herodotus.

**Phersala**, see PHARSALUS.

**Phi Beta Kappa**, oldest Amer. college fraternity, founded by undergraduates at William and Mary College, Williamsburg, Virginia, in 1776, apparently in imitation of the Bavarian order of *Illuminati*, whose first head was Adam Weishaupt, prof. of law at Ingolstadt. The name, formed of 3 letters of the Gk alphabet, is generally supposed to signify the initial letters of the Gk motto, 'Philosophy is the guide of life.' Branches of this honorary society were soon estab. at Yale and Harvard, and later in practically all the prin. univs. and colleges of the U.S.A. Since 1876 women have been eligible for membership on the same terms as men. The society, including past and present graduates, is governed by a national council.

**Phidias**, see PHIDIAS.

**Phigalia**, anc. tn of Arcadia, whose site is now occupied by Pavlitz, 15 m. N.E. of Kyparissia. From its temple of Apollo were brought to the Brit. Museum

the Phigalean Marbles, a frieze representing a contest between Centaurs and Lapithae. The temple was probably built about 430 BC by Ictinus.

**Philadelphia** (modern Ala-Shehr), city in Lydia, Asia Minor, called in honour of Attalus Philadelphus of Pergamum (159-138 BC).

**Philadelphia** (the city of brotherly love) is the largest city of Pennsylvania and the third in pop. (2,071,605) in the U.S.A. It lies 130 m. N. of Washington, D.C., and 80 m. SW. of New York City, and is situated on the Delaware R. at the junction with its great trib. the Schuylkill and 100 m. from its mouth. P. was founded by Wm Penn the Quaker in 1682 as a city in which men of all races might live, each following, unpersecuted, his own religion. It is sometimes called the Quaker City, though the Quaker element no longer prevails. The Daughters of the Revolution, a society of great social importance, has a large contingent here. This too is noted, like Boston, for social exclusiveness, and, though equally busy, it is a quieter and more sedate city than New York, and inclined to Conservative ideals. It is known sometimes as the 'city of homes', and is, unlike many Amer. cities, largely composed of small houses. Its 1600 m. or so of streets are laid out, with few exceptions, with chequerboard regularity. One exception is the wide, tree-lined Benjamin Franklin Parkway, completed in 1924, which runs from City Hall Square in the centre of the city to Fairmount Park, which, the best known and largest of the many open spaces, is nearly 3845 ac. in extent. The city hall, formerly the loftiest building in P., is 548 ft to the top of the statue of Wm Penn which crowns its tower. The city is noted for its private art collections, and it has also a public gallery, housed in the Pennsylvania Academy of Fine Arts (1805). The free public library, founded by Benjamin Franklin in 1731, has 15 branches in the city. Franklin, who was buried in Christ Church cemetery here, founded also, in 1750, the school that grew in 1765 into a college, and in 1779 into the Univ. of Pennsylvania, which now covers 60 ac. and has 9000 students. Its medical, dental, and law schools are particularly noted. P. is celebrated for the efficiency of its elementary schools and for its normal and manual training schools, among which may be mentioned the Drexel Institute and Girard College. Other educational institutions are: Franklin Inst. (1824), Temple Univ., Dropsie College for Hebrew and Cognate Learning, La Salle College, Chestnut Hill College, St Joseph's College, Curtis Institute of Music, Hahnemann Medical College, Jefferson Medical College, and P. Museum School of Art. The Swedish church of Gloria Dei, built in 1700, is the oldest building in the city. Output of manufactured goods is exceeded only by New York and Chicago. Important industries of P. and environs are petroleum and oil refining, metalworking, printing and publishing, shipbuilding, and the manu. of railroad cars, buses, textiles,

clothing, hats, alcohol, leather products, paper, tobacco products, electrical supplies, machinery, rugs, glass, medicines, and processed foodstuffs. Exports are exceeded only by New York, though the city is so far from the sea. It has a total water frontage of 37 m. on the 2 rvs., about 6 m. on the Delaware being occupied with its harbour, which has some 300 wharves. There is a large gov. navy yard at League Is., just above the tn. It is served by 4 railway lines, sev. airlines, and a highway network. P. is one of the most historic cities in the U.S.A., and has an historical society of its own. Independence Hall Building was completed in 1735, and here the constitution of the U.S.A. was framed, and independence proclaimed, as its name indicates. In this building, too, is housed the famous Liberty Bell revered by all Americans. It was the ringing of this bell which announced to the citizens that the declaration of independence from Great Britain had been adopted. Except for the British occupation (1777-8) P. was the cap. of the Federal states from the Revolution until 1800, and the cap. of Pennsylvania from 1683 until 1799 (Harrisburg is now the cap.). The U.S. mint was founded here in 1792. In colonial days P. was a great political centre, and here assembled the hist.-making Continental Congress of 1774. On 4 July 1776 the Declaration of Independence was promulgated here, and Articles of Federation were signed on 9 July 1778. The first cap. of the U.S.A. and its first metropolis, P. has often been compared with Boston, and, like Boston, it is a kind of mirror to Amer. hist., with a copious intellectual tradition and a social aristocracy. But it is much bigger than Boston and much more heavily industrialised. It is more complex, with marked elements of Pennsylvania Dutch, Germans, and British, including Scots and Irish. Like Boston it has a strong puritanical outlook and there is still no alcohol on Sunday, while the cinemas do not open till the afternoon. In 1948 a project for Independence National Historical Park (20 ac.) was authorised to include Independence Hall, the Custom House, Christ Church, and other historic sites. A great disappointment came to P. in 1946: the city had vainly counted on being the United Nations cap., which might have served to revivify it and renew its ancient distinction. See R. Shackleton, *The Book of Philadelphia*, 1918, and C. Morgan, *The City of Firsts*, 1926.

**Philadelphians**, sect founded in London in 1852 by Jane Leade and John Pordage, to explain the works of Jacob Boehme (q.v.), the Ger. mystic. They stressed the necessity of contemplation, and were apparently believed in spiritualism (q.v.). They disappeared early in the 18th cent.

**Philadelphus**, a genus of deciduous shrubs, family Saxifragaceae, about 40 species found in S. Europe, Asia, or N. America; *P. coronarius*, the Mock Orange or Syringa, *P. coulteri*, the Rose Syringa, and *P. microphyllus* are parents of many beautiful garden hybrids, esteemed for their summer flowering.

**Philae**, islet in the Nile, 5 m. S. of Aswân, in Nubia (q.v.). Length about 1200 ft.; breadth about 450 ft. It is famous for ancient temples and ruins, built by the Ptolemies and by the Rom. emperors, chief of which are the temple of Isis, 'Pharaoh's bed' (an incomplete Rom. hall), the shrine of Harendotes, and the Propylon.

**Philanthropy**, see CHARITIES; CHARITY, ORDERS OF; CHARITY COMMISSIONERS; FAMILY WELFARE ASSOCIATION; POOR LAW; NATIONAL ASSISTANCE ACT (1948).

**Philaret** (before becoming a monk Drozdov, Vasily Mikhaylovich) (1783-1867), Russian preacher and theologian, from 1826 Metropolitan of Moscow. He wrote 2 catechisms (see Blackmore, *The Doctrine of the Russian Church*, 1845) and began a trans. of the N.T. into Russian. See his *Select Sermons* (Eng. trans., 1873).

**Philately**. In general usage P. covers both the study and the collecting of postage stamps (q.v.), and thus anybody who is actively interested in stamps, from whatever angle, is known as a philatelist. The word P. is derived from 2 Greek words, *philos*, meaning 'fond of,' and *ateleia*, meaning 'exemption from tax.' It was coined by a Frenchman, M. G. Herpin, in 1866, and has long been universally accepted. Stamp collecting started in a desultory manner not many years after the introduction of the first adhesive postage stamps, the Great Britain 1d. black and 2d. blue of 1840, and though, to begin with, the hobby met with a good deal of derision, being the subject even of some caustic verses in *Punch*, it continued to gain fresh adherents, and by the end of the fifties was fairly well estab. Among the famous pioneer Brit. philatelists may be mentioned the Rev. F. J. Stainforth, Sir David Cooper, Judge Philbrick, Dr C. W. Viner, E. L. Pemberton, J. Overbury Taylor, and W. A. S. Westoby.

As early as 1852 J. B. Moens started dealing in stamps in Brussels, and in 1861 F. G. O. Berger-Levrault issued, for the benefit of his friends, the first stamp list in Strasburg. Three months later A. Potiquet issued, in Paris, a catalogue of stamps for sale, while in 1862 the first jour. devoted entirely to postage stamps, *The Monthly Advertiser*, appeared in Liverpool, to be followed in 1863 by a London pub., *The Stamp Collector's Magazine*. The first Brit. work on stamps, F. Booty's *Aid to Stamp Collectors, being a List of English and Foreign Stamps in Circulation since 1840*, consisting in the main of material previously pub. abroad, came out in 1862. It ran through sev. eds. and was finally reissued with illustrations (the first illustrated work on postage stamps) under the title *The Stamp Collector's Guide*. But the 2 most important of the early catalogues, both pub. later in 1862, were J. E. Gray's *Hand Catalogue of Postage Stamps for the Use of Collectors* and Mount Brown's *Catalogue of British, Colonial, and Foreign Stamps*. The first stamp album was produced by a Frenchman, J. Lallier, in the

same year and was put on sale simultaneously in Paris and London.

To show how the hobby spread, it may be noted that the first stamp auctions were held in Paris in 1865, in New York in 1870, and in London in 1872; while the first philatelic societies were founded in Paris in 1865, in New York in 1867, and in London in 1869. The 2 former have long been defunct, but the last, known originally as the Philatelic Society and now as the Royal Philatelic Society (the 'Royal' was added by warrant of King Edward VII in 1906), is still active and remains unquestionably the leading philatelic society of the world, owning magnificent club rooms and library and publishing its own jour., *The London Philatelist*, since 1892. As stamp collecting grew in popularity the study of stamps became more intense and the desire to read about them more widespread; and if the hobby is recognised as by far the most popular of all hobbies, it may safely be said that the literature concerning stamps is infinitely more extensive than the literature concerning any other hobby. It ranges from elaborate monographs, dealing in minutest detail with the stamps of different countries or even individual issues, to popular books touching upon the romance, the hist., and the interest of stamp collecting in its every aspect. Philatelic journals, running into some 200, of which about a dozen are Brit., are pub. throughout the world, some being highly technical and others consisting mainly of gossip and advertisements. Numerous countries official postal museums, but although the Brit. Post Office has an unrivalled collection, in sheets, of Brit. postage stamps, it is not open to the public, though sections of it are exhibited from time to time. In the Taping collection, left to the nation in 1891 by T. K. Taping and housed in the King's Library in the Brit. Museum, this country owns the finest of all general collections of postage stamps, while the royal collection of empire stamps, started by King George V and continued by his successors, is unique in its range and quality. Portions of this collection are occasionally shown.

In the time of Taping it was possible for one man to form a virtually complete collection of the postage stamps of the world, but that is now impossible, for the market has been flooded for years with issues; the number of stamps produced since 1840 has mounted to sev. hundred thousand, and any serious collector to-day is almost forced to devote his attention to one country or epoch or branch of P. Amongst the reasons which have, of later years, so vastly enhanced the popularity of stamp collecting may be cited the introduction of pictorial and commemorative issues and of air-mail stamps. The first popular commemorative pictorial issue stamps were issued in the U.S.A. in 1893 to celebrate the discovery of America by Columbus, 400 years previously, and it was probably the success of this set of 16 stamps which has led to the immense number of

such sets since that date. Great Britain has never issued a pictorial stamp in the real meaning of the word (although the Queen Elizabeth high values show castles as part of their designs); however of recent years stamps to commemorate the silver jubilee of the reign of King George V, the coronation of King George VI, and other national events have appeared. Great Britain has never issued an air-mail stamp, though some of the most valuable of such stamps, the air-mail stamps of Newfoundland issued in the early days of Atlantic flying, emanated from a Brit. dominion.

The value and saleability of rare stamps depend, apart from their scarcity, upon sev. factors. First, they must belong to those countries and issues which are particularly collected and, secondly, they must be perfect in every respect. There are many fashions in P., but the earlier stamps of such countries as Great Britain, the U.S.A., Canada, Newfoundland, W. Indies, Cape of Good Hope, Ceylon, Brit. Guiana, Mauritius, New S. Wales, Hawaiian Is., France, Spain, and the I. and Ger. states are practically immune from the vagaries of taste. The really classic stamps of these and other countries, having an international appeal, have mostly risen greatly in price during the last few decades, and this, added to the fact they are such an easily portable form of wealth, has caused many people in troublous times to regard them as a desirable investment. As for condition, this is a point which, ignored by most of the early collectors, has become more and more significant. The difference in value between superb and poorish copies of even the rarest stamps is startling, and where imperforate stamps are concerned only one in 25 or 50 examples has clear margins on all 4 sides. Many stamps are rare and valuable because they contain errors. The observed variety of such errors is very large, but some of them can be mentioned. There may be a mistake in the wording or the type; a wrong paper or colour or perforation or watermark (q.v.) may be used; a surcharge or overprint (a surcharge alters the face-value

of a stamp, while an overprint does not) may be repeated twice or more or may be printed upside down or on the back or omitted altogether; a price label may be missing; a perforate stamp may be printed imperforate; the centre of a stamp or the frame round the centre may appear in an inverted position. To appreciate how such errors arise it would be necessary to explain how stamps are constructed and printed, but basically they are all due to the fact that though man employs machines, he is not a machine himself.

The highest price known to have been paid for a single stamp is £7343. This was paid by Arthur Hind in the U.S.A. for the Brit. Guiana 1 cent of 1856, the only discovered example of the error whereby the normal '4 cents' label was accidentally replaced by a '1 cent' label. After Hind's death the stamp was put up for auction in London, and withdrawn, the reserve not having been reached. It was returned to the U.S.A., where, it is rumoured, it was privately sold for more than Hind had originally paid for it. During the Caspary sale in New York, 1957, \$25,000 was obtained for a letter bearing the 2 cent and 5 cents Hawaiian Missionary stamps. In the same sale a world record price of \$48,000 was paid for a single lot comprising 2 complete sheets of 100 stamps each of the 10 centimes and 20 centimes Belgian 1850. Alfred Lichtenstein, it is said, gave £12,000 for an envelope stamped with two matchless copies of the Mauritius 1d. of 1847, while the absolutely mint copy of the Mauritius 2d. of 1847, which King George V. as Prince of Wales, purchased in 1903 for £1450, would undoubtedly bring nearer £10,000 to-day. These were the first 2 stamps to be issued by any Brit. possession, and through some misunderstanding, had 'Post Office' instead of 'Post Paid' printed on them. Other exceedingly rare and valuable stamps, to mention 6 normal ones and 6 with errors, include Canada 12d. (1850), Brit. Guiana 2 cents (1851), Hawaiian 1s. 2 cents (1851), Ceylon 4d. (1857), Moldavia 81 parales (1858), Brit. Columbia 5 cents

### SOME FAMOUS POSTAGE STAMPS

1. 1847 *Mauritius*. This 1d., together with a 2d. of the same date, were the first stamps issued by a British colony. They are the most famous stamps in the world.
2. 1851 *Canada*. When this stamp was issued the shilling had a varying value throughout Canada while the penny was constant: hence the curious figure.
3. 1857 *Ceylon*. Only a few copies are known unused.
4. 1854 *India*. With inverted head, this is the most valuable Indian stamp.
5. 1854 *Western Australia*. A very rare stamp with inverted frame.
6. 1851 *British Guiana*. One of the two rarest stamps of the colony, not known to collectors in Europe until 1877.
7. 1851 *Hawaii*. The earliest Hawaiian stamps were mainly used by American missionaries writing home: indeed they are often called "missionaries."
8. 1858 *Moldavia*. A stamp of great rarity. Moldavia is now a republic of the U.S.S.R.
9. 1869 *United States of America*. The centre of this heavily post-marked stamp is inverted, being known as the 'Inverted Flag.' It is a rarity of note.
10. 1902 *Great Britain*. This stamp of Edward VII. is one of the two most valuable stamps of Great Britain.
11. 1860 *Tuscany*. In fine condition, this stamp is a classic rarity.
12. 1920 *Jamaica*. With inverted centre, this is one of the rarest British Empire stamps issued during the reign of George V.





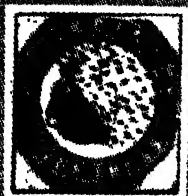
1. 1847



2. 1851



3. 1857



4. 1854



5. 1854



6. 1851



7. 1851



8. 1858



9. 1869



10. 1902



11. 1960



12. 1920

(1865), India 4 annas, with inverted head (1854), New S. Wales 4d., with inverted frame (1854), Cape of Good Hope 1d. and 4d., in the colour of each other (1861), U.S.A. 24 cents air mail, centre inverted (1918), Jamaica 1s., centre inverted (1919). The most valuable Brit. stamps are not Victorian but Edwardian: the 6d. and 10s. of 1902 each overprinted 'I. R. Official.' The 10s., so overprinted, was in use for but a brief period, while the 6d., so overprinted, was in use for only 1 day, 12 May 1904. But some of the early Brit. 'abnormals' (stamps printed from plates which were hardly ever employed) are also very valuable, as are some of the early high face-value stamps, 10s., £1, and £5, particularly if unused. Most stamps, it may be added, are more valuable unused than used, but the rule is by no means universal, especially if it be a bisected stamp, for during sudden shortages of stamps in the early days this practice was occasionally officially sanctioned in some countries and colonies, and it is necessary to make sure that the postmark is genuine.

The forging of stamps began soon after they came into general circulation, and as long ago as 1862 J. B. Moens wrote a pamphlet (the Eng. ed. is a trans. from the Belgian ed. of the same year) entitled *On the Falsification of Postage Stamps*, while in 1863 T. Lewes and E. Pemberton wrote *Forged Stamps: How to Detect Them*. The early forgers aimed at defrauding the revenue rather than the collector, and much of their work was excessively crude, but the later forgers and takers (and it is the faking of genuine stamps, either by repairing them or by adding some detail to transform a common stamp into a rare variety, which is the prin. danger these days) have often shown remarkable, if misguided, skill. But it is satisfactory to know that even their most finished efforts cannot deceive the real expert.

Books and articles on P. dealing with every country and every branch and phase of study and collecting abound. For Great Britain the works of H. B. Wright and A. B. Creeke, J. B. Seymour, Sir E. D. Bacon, S. A. R. Oliver and F. H. Valency, T. Todd, and P. Hamilton are of importance. *Bibliotheca Lindesiana*, 1911, with *Supplement*, 1926, compiled by Sir E. D. Bacon, and *The Standard Index to Philatelic Literature*, ed. by A. H. Harris and analysing books and journals from 1879 on, are admirable works of world-wide bibliographical reference, but both are now somewhat out of date. Enormous and informative stamp catalogues are issued annually by such firms as Stanley Gibbons in London, Scott in New York, Yvert and Teller-Champion in Paris, Galvez in Madrid, and others. See also *POSTAGE STAMPS*. See T. Todd, *A History of British Stamps*, 1949.

Philby, Harry St John Bridger (1885- ), explorer and orientalist, b. Ceylon. Son of a tea-planter, he was educ. at Westminster School and Trinity College, Cambridge. He joined the Indian civil service in 1908, and became political

officer in Amara. He led the Brit. political mission to central Arabia, 1917-18. P. crossed the Arabian Peninsula from Uqair to Jidda, and explored the S. provs. of Nejd, in 1920. He was Brit. representative in Transjordan, 1921-4. He crossed the Rub al' Khali ('Empty Quarter') Desert in 1932, soon after its crossing by Bertram Thomas. His pubs. include *The Heart of Arabia*, 1922, *Arabia of the Wahabis*, 1928, *Arabia*, 1930, *The Empty Quarter*, 1933, *Pilgrim in Arabia*, 1943, and *Arabian Days*, 1948.

Philemon, Gk writer of the New Comedy, b. Soli, Cilicia, according to Strabo, or at Syracuse according to Suidas. P. began to exhibit comedies a little earlier than Menander and before 328 BC, and died in the reign of the second Antigonos, son of Demetrius. He lived nearly 100 years. He is said to have written 97 comedies, of which only fragments exist. These are generally pub. with those of Menander, whose rival he was, and are to be found in T. Kock, *Comicorum Atticorum Fragmenta* II, 1884. See T. B. L. Webster, *Studies in Later Greek Comedy*, 1953.

Philemon, Epistle to, the shortest of St Paul's epistles written during his imprisonment, addressed to P., an hospitable Christian of Colossae, asking him to take back his former slave, Onesimus, who, having first robbed his master, had run away, probably to Rome, where he had been converted to Christianity by Paul. Its authenticity is beyond question. See commentaries by Lightfoot, 1884; Beet, 1890; Hastings's *Dictionary of the Bible*, vol. ix, 1917; Robati, 1933; Crafer, *New Commentary*, 1928; and Shearer, *Catholic Commentary*, 1953.

Philemon and Baucis, of Phrygia, a devoted married pair who entertained Zeus and Hermes in disguise when they had been refused hospitality by everyone else. The gods took them to a hill, whence they saw their vil. submerged in flood, their own cottage only rising in the form of a temple above the water. When Zeus asked them to ask a favour they begged to serve in his temple and to die together. At death Philemon became an oak and Baucis a linden.

Philetas of Cos (fl. 4th to 3rd cents. BC), Gk elegiac poet and grammarian of the Alexandrian school. He was tutor to Ptolemy II and wrote a commentary on Homer. See fragments of his poems in G. Kuchenmüller, *Philetas Cui Reliquiae*, 1928.

Philharmonic Societies. The Royal Philharmonic Society was founded in London in 1813 by J. B. Cramer and others, to foster musical ideals by giving concerts on a subscription basis; its career has been most successful. P. S. have been estab. also in New York and elsewhere.

Philidor, François André Danican (1726-95), Fr. composer and chess player, member of a family that included at least 12 musicians of some importance, some mainly as woodwind players at the Fr. court. He was b. at Dreux, the son of André P. the elder (d. 1730), nephew of

Jacques P. (1657-1708) and brother of Anne P. (1681-1728), the 3 most important members of the family apart from himself. Having lost his father early, he became a page at court, where he learnt to play chess, in which he became so proficient that he toured abroad to display his skill, starting at Amsterdam in 1745. He was invited to England by Lord Sandwich and the Duke of Cumberland, and published his treatise, *Analyse du jeu des échecs*, there in 1749. He heard and was influenced by Handel's oratorios, in imitation of which he wrote motets on his return to Paris in 1754. In 1756 he began to write comic operas, and between that year and 1788 he wrote over 30 works for the stage, some very successful. In his last years he was pensioned by the Chess Club in London, lived there a good deal, and *d. there*. Among his best operas are *Blaise le savetier* (after Lafontaine), *Sancho Pança dans son île* (after Cervantes), and *Tom Jones* (after Fielding).

**Philip, kings of Macedonia, see PHILIPPOS.**

**Philip, Saint**, one of the first disciples of Jesus Christ and one of the apostles. He was a native of Bethsaida, a town near the sea of Tiberias. He has been erroneously confounded with Philip the Deacon. P. is said to have suffered martyrdom at Hierapolis, but in what year is not known.

**Philip I (1052-1108)**, King of France son of Henry I. He succeeded to the Fr. throne in 1060. At first the ally, he afterwards became the opponent of William the Conqueror, and they quarrelled principally over the possession of Maine. He quarrelled with the papacy because of his bigamous marriage with the countess of Anjou and was excommunicated in 1094. He considerably extended the boundaries of the Fr. kingdom, however, by his wars with the rulers of Anjou and Flanders.

**Philip II (1165-1223)**, King of France, commonly known as Philip Augustus, *b. Gonesse*. He was crowned king during the lifetime of his father, Louis VII, and succeeded him in 1180. His reign was devoted to his attempt to consolidate the ter. and power of the Fr. crown. With this end in view he supported the sons of Henry II of England in most of their frequent quarrels with their father. He succeeded also in subduing the Count of Flanders and the Duke of Burgundy. He was one of the chief members of the league which did much to crush the power of Henry II in France. He went on crusade with Richard I, but quarrelled with him, and returned from Syria to plot against him. The sudden return of Richard, however, upset the plans of P. and John, and resulted in a war which lasted until 1199. On the accession of John he supported the claim of Arthur of Brittany to the Eng. throne. On the murder of Arthur he summoned, as John's overlord, the Eng. king to answer for the deed in Paris, and when John failed to appear invaded Normandy. The fall of Château-Gaillard resulted in the practical conquest of Normandy, and virtually put an end to

the Angevin empire. He gained influence in S. France by intervening against the Albigenses. The height of his ..... however, was the battle of Bouvines in 1214, where he succeeded in defeating the combined forces of England and the empire. The rest of his reign was occupied in administrative reforms. He quarrelled with the papacy on his repudiation of his wife Ingeborg, and subsequent marriage to Agnes Meran, and France was put under an interdict until P. took Ingeborg back. *See A. Luchaire, La Société française au temps de Philippe-Auguste*, 1909, and life by W. Hutton, 1896.

**Philip III (Le Hardi) (1245-85)**, King of France, son of Louis IX. (*St Louis*), *b. Poissy*. He accompanied his father's unfortunate expedition to Tunis, and succeeded him in 1270. He later fought a long and unsuccessful war with Aragon.

**Philip IV (1268-1314)**, commonly called 'Le Bel,' King of France, *b. Fontainebleau*, succeeded Philip III in 1285. He married the Queen of Navarre, Joanna, and by this marriage obtained Champagne, Briz, and Navarre. Early in his reign a revolt broke out in Flanders, and P. was decisively defeated at Courtrai (1302). His attempt to levy taxation upon the clergy led to Pope Boniface VIII issuing the famous bull, *Unam sanctam*, to which P. replied by a wholesale confiscation of clerical property. The pope retaliated by an excommunication and a threat of interdict. P. had the Pope arrested and so maltreated that he *d.* shortly afterwards. After the brief pontificate of Boniface's successor, Benedict XI, a Fr. pope, Clement V, was elected and, under the influence of P., moved the papal court to Avignon, where it remained for 70 years. In this reign the order of the Knights Templars was abolished, and its wealth confiscated by the Fr. king.

**Philip VI (1293-1350)**, King of France, the first of the Valois kings. He was the son of Charles of Valois, the brother of Philip IV. On the death of Charles IV in 1328 he succeeded to the Fr. throne, the Salic law being pleaded in order to prevent the accession of Charles the Bad of Navarre and Edward III of England, who used his claim as a pretext for invading France in 1337. In a battle with the Eng. off Sluys (1340) the Fr. fleet was entirely destroyed. In 1346, after threatening Paris, Edward retreated towards Flanders, but Philip pursued him and was decisively defeated at Crécy (*see CRECY, BATTLE OF*).

**Philip I (1478-1506)**, King of Castile, surnamed the Handsome, *b. Bruges*. He was the son of Maximilian I, Emperor of Germany, by Mary of Burgundy, in right of whom he inherited and transmitted to his posterity of the house of Austria the 17 provs. of the Netherlands. In 1496 he married Joanna, eldest daughter of Ferdinand the Catholic and Isabella, sovereigns of Aragon and Castile; and in 1504, on the death of Isabella, who bequeathed the kingdom of Castile to her daughter, P., as well as his consort, assumed the regal title. He was crowned at

Burgos with her, and, because of her insanity (said to have been made worse by his constant infidelity) governed on her behalf until his death.

**Philip II (1527-98)**, King of Spain, the only son of the emperor Charles V, b. Valladolid. He married, in 1543, the daughter of the King of Portugal, who bore him before her death, in 1546, a son, Don Carlos (q.v.). P. spent much of his time in his father's favourite prov., the Netherlands, and before the death of his father he married, in 1554, Mary I of England. In 1556 his father abdicated and P. became the most powerful monarch in Europe, although his father's attempt to



PHILIP II

obtain for him the imperial throne failed. He left England at the end of 14 months, dissatisfied also that Mary had failed to bear him a son and after her death married, thirdly, Elizabeth of France. He succeeded in breaking up the formidable league raised against him by the papacy and the French, and set himself up in Europe as the champion of the counter-reformation. He crushed heresy in Spain by means of an energetic use of the Inquisition, but failed in the Netherlands, where his oppressive measures and his heavy taxation led to revolt, civil war, and finally to the breaking away of the United Provs. (Holland). In 1570 he married Anne of Austria, who became the mother of Philip III. In the following year his half-brother won the great victory at Lepanto over the Turks. He annexed Portugal to Spain in 1580, claiming the throne on the extinction of the male line. This was, in fact, his most complete success. After the execution of Mary Queen of Scots, and goaded by the frequent raids of the Eng. privateers on Sp. treasure-ships and settlements, he sent his Armada (q.v.) to England, but it was (1588) badly defeated. His home policy had led to the practical bankruptcy of Spain, and his long war against the Moors led to the extinction of much of the trade of the country. In 1592 he failed in his attempt to drive Henry of Navarre from the throne of France. P.

had great ability, but this was overshadowed by stubborn fanaticism, and by his usual unwillingness to listen to expert advice, or to delegate authority. He raised Spain to a dominant position in Europe, but left her with a governmental system which undermined her prosperity. See W. H. Prescott, *History of the Reign of Philip II*, 1855-8; and lives by M. Philippson, 1882; L. Bertrand, 1929; D. Loth, 1932; L. Pfandl, 1938; and W. T. Walsh, 1938.

**Philip III (1578-1621)**, King of Spain, b. Madrid, the son of Philip II by his third marriage, he succeeded to the throne of Spain in 1598. He left the government of the country almost entirely in the hands of his incompetent minister, Lerma, and the dwindling resources of the country were extravagantly squandered at court. During his reign occurred the attempt to bring about a Sp. marriage with Prince Charles (afterwards Charles I) and the outbreak of the Thirty Years War, in which Spain was very largely involved. In 1609, a treaty was made with the United Provs. which practically assured them of their independence, although this was not officially recognised until 1648. Under P. the whole Moorish pop. excepting Christians and young children was expelled from Spain, a decision which speeded the commercial decline of the country.

**Philip IV (1605-65)**, King of Spain, b. Valladolid. He succeeded his father Philip III in 1621, and during the early part of his reign the country was governed by Olivarez, whose foreign policy was largely disastrous. The Dutch captured many of the Sp. colonial possessions; Portugal recovered her independence in 1641, and 2 years later, by the defeat at Rocroi, the prestige of the Sp. Army was badly shaken. After the Peace of Westphalia was signed in 1648 (under which Spain formally recognised the independence of the United Provs.), the Spaniards and French still continued fighting until by the treaty of the Pyrenees (1659), Spain ceded much ter. to France. In 1665 Portugal defeated Spain at Villa Vicosa. P. is primarily remembered as a patron of art and letters, Velasquez (q.v.) being his court painter.

**Philip V (1683-1746)**, King of Spain, the first of the Bourbon kings of Spain, b. Versailles. He was the second son of the dauphin of France and the grandson of Louis XIV and Maria Theresa of Spain. He succeeded Charles II in 1700, entered Madrid in 1701, and at the end of the War of the Sp. Succession was by the treaty of Utrecht guaranteed the throne of Spain, certain stipulations being made to prevent his obtaining the throne of France as well. He married, as his second wife, Elizabeth Farnese, and as a result of her ambitions in Italy for the sons of her former marriage, was involved in a struggle with the Austrians. P. abdicated for a short time in 1724, but on the death of his son again ascended the throne.

**Philip, Prince of the Realm and Duke of Edinburgh (1921- )**, husband of Queen

Elizabeth II (q.v.), whom he married on 20 Nov. 1947. *B.* Corfu, the son of Prince Andrew of Greece, he was educ. at Cheam and Gordonstoun, and the Royal Naval College, Dartmouth. At 18 he passed into the Royal Navy, serving throughout the Second World War in the Mediterranean and Far E. He renounced his rights of succession to the Gk and Danish thrones, 1947, became a naturalised Brit. subject, adopting the surname of Mountbatten. Before his marriage he was created Baron Greenwich, Earl of Merioneth, and Duke of Edinburgh, and made K.G. For some time after his marriage he continued his active naval

the second and last ducal house of Burgundy, the third son of John II, King of France, *b.* Pontoise. He was present at the battle of Poitiers (1356), and displayed such courage there that he was subsequently known as *le Hardi*, or 'the Bold.' He was made Duke of Burgundy, 1363. On the accession of his brother, Charles V, to the Fr. throne, he married Margaret, the heiress of Flanders. In 1372 he commanded the Fr. army against the Eng. In 1382 he suppressed the Flemish rebellion with extreme ferocity. Flanders Burgundy, Artois, Rethel, and Nevers fell to him by the death of the count in 1384. During the minority and subsequent imbecility of his nephew Charles VI of France, he became regent of the country. Utterly ruthless, he governed his ters. with vigour and efficiency, and was one of the best Fr. gens. of the period.

**Philip the Deacon**, one of the 7 deacons chosen to relieve the 12 apostles of the burden of attending to charitable distribution (Acts vi. 5). He was driven from Jerusalem by the persecutions and went to Samaria to preach, where he had great success. Thence he was sent to baptise the eunuch of the Ethiopian queen Candace (Acts vi. 8). *P.* then went on a preaching tour to Caesarea, and later he entertained St Paul and his company (Acts xxi. 8). Tradition says that later he settled in Asia Minor, but he has been confused with Philip the apostle. His feast is on 6 June.

**Philip the Good**, third Duke of Burgundy (1396-1467), grandson of Philip the Bold. On the assassination of his father (1419) at the instigation of the dauphin, he succeeded to the duchy. Bent on avenging the murder of his father, he allied with Henry V of England, in 1419, but eventually made peace with Charles VII, 1429. He subsequently rejoined the Eng. side, and captured Joan of Arc (q.v.) at Compiègne. But in 1435 he again made terms with Charles, and helped to expel the English from their Fr. possessions. Later, he helped the dauphin Louis against his father. He was the founder of the Order of the Golden Fleece and a patron of the arts and the univs.

**Philiphaugh**, battlefield on Yarrow Water, 3 m. WSW. of Selkirk, Scotland, where Sir David Leslie defeated the Royalists under Montrose (1645).

**Philippe Egalité**, see ORLEANS, DUKES OF.

**Philippeville** (anc. *Rusicoada*), seaport of Algeria, in the dept. of Constantine. It has a fine harbour, and exports cattle, cereals, dates, esparto grass, and minerals. Pop. 70,274.

**Philippi**, anc. city of Macedonia, on the Gangites, was so called after Philip II of Macedon. It is celebrated for the victory of Antony and Octavian over Brutus and Cassius in 42 BC. St Paul founded (AD 53) a Christian colony here, to which he addressed his epistle to the Philippians.

**Philippians, Epistle to the**, probably the last epistle St Paul wrote during his captivity at Rome, during the latter part of this period. Its date would therefore



Portrait by Antony Armstrong Jones

H.R.H. PRINCE PHILIP

career. Later *P.* and his wife undertook more and more public functions as the king's ill-health increased. They visited Canada in 1951 and had started on the first stage of a Commonwealth tour, 1952, when news of the death of King George VI reached them. Since his wife's accession to the throne *P.* has accompanied her on all the prin. state occasions and has undertaken a considerable number of independent public engagements. In 1956 he opened the Olympic Games in Melbourne. He has shown an especial interest in young people, and in scientific matters, and his friendliness and informality have made him universally popular. He was made a Prince of the Realm in 1957.

**Philip Neri**, see NERI.

**Philip of Greece and Denmark, Prince**, see PHILIP, PRINCE OF THE REALM AND DUKE OF EDINBURGH.

**Philip of Macedonia**, see PHILIPPOS.

**Philip the Bold** (1342-1404), founder of

be between 62 and 64 according to the ordinary chronology, between 57 and 59 according to that of Harnack. The church in Philippi had been planted some 10 years previously on the second missionary journey (see Acts xvi, etc.), and was composed chiefly of pious Gentiles. The Epistle contains perhaps St Paul's most striking passage on the Divinity of Christ and the Incarnation (ii. 5-11). In the region in which Philippi stood women occupied a higher social position than elsewhere, and the epistle shows us the importance of the feminine element in the Church. See commentaries by M. R. Vincent, 1897; J. D. Lightfoot, 1903; J. H. Michael, 1928; H. G. G. Herklots, 1946; see also H. N. Bate, *Guide to the Epistles of St Paul*, 1928.

**Philippics**, 3 orations of Demosthenes, the Grecian orator, against Philip, King of Macedon, in which the orator sought to arouse the Athenians from their indolence; hence any discourse or declamation abounding in acrimonious invective, e.g. the 14 orations of Cicero against Mark Antony.

**Philippine Islands**, or **The Philippines**, archipelago forming the Republic of the Philippines, situated about 550 m. off the S.E. coast of Asia, between 4° 40' and 21° N. They are bounded on the W. by the China Sea, E. by the Pacific Ocean, and S. by the Celebes Sea and the coastal waters of Borneo. The total land area of the P. I. is 114,830 sq. m., and includes the is. of Luzon, 40,420 sq. m., most northerly; Mindanao, 36,537 sq. m., most southerly; Samar, 5050 sq. m.; Negros, 4905 sq. m.; Palawan, 4550 sq. m.; Panay, 4446 sq. m.; Mindoro, 3750 sq. m.; Leyte, 2785 sq. m.; Cebu, 1702 sq. m.; Bohol, 1491 sq. m.; Masbate, 1262 sq. m.; and over 7000 others, mostly very small. The is. are mostly of volcanic origin, and the larger ones have great mountain ranges. On the E. coast of Central and N. Luzon is the Sierra Madre range, on the W. coast is the Caraballos, N. from the Gulf of Lingayen, and the Zambales southward from that gulf to Manila Bay. Mt Mayon (2926 ft), an active volcano, lies at the S.E. extremity of Luzon, and Mt Apo (9890 ft), also an active volcano, on the E. border of the S. portion of the basin of the Rio Grande, Mindanao, is the highest elevation in the archipelago. The Cagayan R., 220 m. long, in N. Luzon is the longest in the archipelago; the Pulang, or Rio Grande de Mindanao (200 m. long), is second in size. The Pampanga and the Agno are the prin. rvs. in Central Luzon. The Pasig, though short, is of importance. The other is. are drained by many streams, some of which are of considerable size. Laguna de Bay, about 30 m. long and 25 m. wide, the largest body of fresh water in the P. I., is situated in the low-land basin of S. Luzon, 8 m. inland from Manila Bay. The other prin. lakes are: Lake Taal (15 m. long), S.W. of Laguna de Bay; Lake Cagayan in N. Luzon; in Mindanao, Lanao, Liguasan, and Buayan in the W. central portion and Mainit,

Pinaya, Dagun, Dadocum, and Linao in the valley of the Agusan. There are small lakes in some of the other is. Volcanoes in the archipelago are Mt Pangasinan (active, 3569 ft) on Babuyan Is. off the N. coast of Luzon; Cagua or Caua (active, 3800 ft) in N. Luzon; Canlaon (active, 8088 ft) on Negros; Camiguin (active, 4370 ft) on the is. of Camiguin, off the N. coast of Mindanao; Apo (active, 9890 ft) on Mindanao; and Taal and Mayon. Taal has been silent since 1911; 26 eruptions of Mayon occurred in the 19th cent., the most destructive of which was in June 1897, when the tn of San Fernando and many vils. were destroyed. The most recent eruption of Mayon was in 1947. An eruption of Mt Camiguin in 1948 caused evacuation of the is. Earthquakes and typhoons are of frequent occurrence in the is.

The fauna of the is. shows a large degree of specialisation, but the number of species and their respective ranges have not yet been satisfactorily determined. There are about 690 species of birds; crocodiles and fishes, of which there are 500 species, are numerous. Arthropoda are very abundant. The flora, which is essentially Malayan and intermixed with Chinese and Australian elements, is rich and varied. More than half the land surface is covered with forests; trees yielding rubber, quinine, etc., abound, and there are also good timber trees, dye woods, etc. The soil, usually of a reddish colour, is for the most part disintegrated lava mixed with decayed vegetation. The climate, which is more salubrious than most tropical climates, varies little throughout the year, temp. being uniformly high. Agriculture is the prin. industry of the is., and the prin. crops are hemp, sugar, tobacco, coconuts, corn, sweet potatoes, and rice. Many fruits have been introduced, including grapes, blackberries, figs, and strawberries, but bananas, mangoes, and citrus fruits are more generally grown. The P. I. are among the world's foremost producers of coconut oil and copra. During 1955 copra exports totalled 786,449,000 kg. There are also papaya, lanzones, chico, and pill nut (*Canarium commune*). In 1953 4,072,992,000 kg. of rice were produced. Maize and maguay are also grown. With the exception of the water-buffalo, which is indispensable for agric. purposes, the domestic animals are few in number, but they are steadily increasing. Amer. horses have been introduced to improve the breed. The neat cattle, which are of Australian and Indian origin, are raised chiefly for beef, hides, and horns. Swine and goats are numerous, but there are few sheep. The is. are potentially rich in economic minerals, and extensive gold-mining operations have been instituted in the provs. of Benguet and Ambos Camarines in Luzon, and on the is. of Masbate. In 1955 the output of gold was 419,112 fine oz. The P. I. are among the first 10 gold producers in the world. Chromite has been discovered; in 1955 598,117 metric tons were exported. Copper is

widely distributed. There are outcrops of lead, with which silver is largely associated, and extensive deposits of iron ore (export in 1955 was 1,432,712 metric tons). Among other minerals are manganese ore, sulphur, mercury, zinc, gypsum, and phosphate; coal has been discovered, asbestos, rock asphalt, and silica deposits have been found, and drilling for oil has been resumed. There are now 32 metal mines and 30 non-metal mines producing, of which 16 yield gold and silver. The first railway, opened in 1892, was built by an Eng. corporation under the guarantee of the Sp. Gov., from Manila to Dagupan (121 m.). The advent of Amer. rule saw a great increase in railways, and in 1955 there were some 741 m. on Luzon and Panay. Roads also have been greatly improved and extended (total length is 24,427 m.), and there are regular steamers to Singapore and Hong Kong, and between the prin. ports of the archipelago. The greatest value of commerce in 1955 was with the U.S.A., totalling 748,405,000 pesos; then came Japan, 86,879,000 pesos, Indonesia, 37,833,000 pesos, Great Britain, 25,557,000 pesos, and the Middle East, 24,264,000 pesos. Total imports in 1953 were valued at 894,700,000 pesos, and exports at 801,200,000 pesos. Before the Jap. invasion there were 46 sugar centrals and 4 refineries, textile mills, coconut oil mills, 92 large cigarette and cigar factories, and 2391 rice mills. Now 25 sugar centrals and 144 cigar and cigarette factories are in operation. In 1955 926,796,000 kg. of sugar were exported. Other important exports in 1955 were: logs and lumber, 685,605,000 kg.; abaca, 111,802,000 kg.; coconut oil, 74,177,000 kg.; desiccated coconut, 48,529,000 kg.; copper concentrates, 30,306,000 kg.; and canned pineapple, 33,353,000 kg. In 1946 free trade was estab. between the U.S.A. and the P. I. for 8 years. There are 206 ports. Manila, the prin. port of entry, with a channel 30 ft deep, has the finest harbour in the entire Far E. At Cavite is a navy yard which still belongs to the Amer. forces. After Manila, former cap. (pop. 983,906), the chief tns are Cebu on Cebu (167,503); Davao on Mindanao (111,263); Iloilo on Panay (110,122); Quezon City on Luzon, cap. since 1948 (107,977); Zamboanga on Mindanao (103,317); and Baguio (29,692) in the Mt Prov., the summer cap. Other tns are Legaspi, Laong, Vigan, and Naga on Luzon. The total pop. of the archipelago according to the U.N. estimate of 1954 was 21,440,000.

**Constitution and Government.** The new independent Republic of the Philippines came into being on 4 July 1946, by agreement with the U.S. Gov. embodied in an Act of Congress signed by President Roosevelt on 24 March 1934, accepted by the Philippine Legislature on 1 May 1934, and ratified by the Philippine electorate soon afterwards. This Act estab. a 10-year transitional period designated as that of the 'Philippine Commonwealth,' at the end of which complete independence would become automatically effective.

But owing to the Jap. invasion and occupation this period had to be prolonged. The rep. is governed by a constitution adopted in 1935 and amended in 1940. The president and vice-president are elected for 4 years, and the former may be re-elected for another term. There are 10 cabinet members, heading depts of foreign affairs, justice, national defence, health, education, finance, public works and communications, labour, commerce and industry, and agriculture and national resources. The legislature is bicameral: a Senate of 24, and a House of Representatives of 120 members. The franchise is given to both male and female citizens of 21 years of age or older who can read or write Spanish, English, or a native dialect and who have certain residential qualifications; but rural illiteracy is high, and at the 1953 elections registered voters numbered no more than 5,601,963, of whom 4,325,904 actually voted. The president's powers are wide, including control of the provs. and municipalities, and limited powers of veto. The constitution vests in the rep. all ownership of the natural resources, which, apart from public agric. land, may not be alienated. Exploitation of natural resources is confined to citizens of the P. I. or, for a limited period, of the U.S.A. and to corporations or associations 60 per cent of whose capital is owned by Filipinos (see J. M. Aruego, *The Framing of the Philippine Constitution*, 2 vols., Manila, 1937). Despite the proclamation of the new rep., close relations by agreement between the P. I. and the U.S.A. remain. An agreement of 1946, expiring in 1974, opened to Amer. interests or companies equal trading rights.

The U.S.A. is allowed to develop and maintain strong military, naval, and air bases in the archipelago. The is. fortress of Corregidor in Manila Bay was, however, transferred to the Republic of the Philippines on 11 Oct. 1947. In 1954 it became, with Bataan, a national shrine. The U.S.A. continues to represent Filipino interests abroad where the rep. has not yet estab. representation of its own. Furthermore, the Philippine Trade Act, signed by President Truman on 30 April 1946, assured the continuance of complete free trade between the two countries for 8 years ending 3 July 1954; to the end of 1954 Filipino exports to the U.S.A. paid a duty equal to 5 per cent of the existing Amer. duties, the duty thereafter to increase by 5 per cent a year until the full duty is payable after 3 July 1974.

**Religion.** Rom. Catholicism is the chief religion, and has some 15,941,422 adherents, or three-quarters of the pop. An independent Filipino Church was founded in 1902 by Gregorio Aglipay, an ex-Catholic priest, who assumed the title of Obispo Maximino. The ritual of this Church resembles that of the Rom. Church, but in doctrine it adheres to modern science and denies the possibility of miracles, and marriage is permissible for its apostles. The following of this Church is 1,456,114. There are 532,618 Protestants, 42,751 Buddhists, 791,817



Muslims (chiefly on Mindanao and Sulu), and 353,842 Pagans.

**Education.** Education in the public schools is free, secular, and co-educational. Although Tagalog, a Malayan dialect, is the official language, English is the medium of public instruction. In 1955 there were 4,133,725 pupils in the 22,238 public schools. There are a normal school, 6 regional normal schools, trade schools, and agric. and farm-settlement schools. Higher education is provided by the state-supported Univ. of the Philippines, and by many private institutions of higher learning, including the Univ. of Santo Tomas.

**Justice.** The judiciary is headed by the supreme court, with a chief justice and 10 associate justices appointed by the president; it cannot declare a law or treaty unconstitutional except by a two-thirds vote. The rep. is divided into judicial dists., each with sev. judges of first instance, justices of the peace courts, and municipal courts.

**The Filipinos.** The word Filipino may be used with the following meanings: (1) a native of the P. I. of Sp. descent; (2) the Christian pop. of the P. I., numbering about 18,000,000; or (3) the native pop. of the P. I. The Filipinos, in the widest sense of the word, are a mingling of many races, speaking perhaps a hundred differing languages or dialects, professing different religions, and living in various grades of civilisation. There are over 80 ethnic groups. About 1,750,000 are of the 'primitive' type, including the 'Negritos' (Negroes of the P. I.), who appear to be a small remnant of the original inhab., and are a dwarfish race, believed to be akin to the Australian 'black' natives. The Sulu Archipelago, W. Mindanao, and W. Palawan are inhabited chiefly by some 300,000 Moros (Spanish for 'Moors'); like most of the natives, they are of Malay stock (mainly from Borneo), and they chiefly differ from the others in their religion, being Muslims, while the others are mostly Christian. They have a native literature, and use a modified Arabic alphabet.

The bulk of the native pop. speak languages belonging to the great Malay-Polynesian family (see LINGUISTIC FAMILIES). In point of number the 3 most important groups are: (1) the Bisayans or Visayans (4,840,708), the most civilised people in the archipelago when it was discovered by the Spaniards, now mainly living in the central part of the P. I. and in N. and E. Mindanao; (2) the Tagalogs or Tagals (7,126,913), now the most advanced people of the P. I., living in Central Luzon, including Manila, and in the greater part of Mindanao; (3) the Iloks or Ilocanos (2,687,861), mainly in NW. Luzon. Other important vernaculars are Pampangan (707,291), mainly in the prov. of Pampanga, to the N. of Manila Bay; Pangasinan (665,342), N. Luzon; and especially Bikol or Bicol (1,535,411), also in Luzon. Spanish and English are much spoken, in spite of the designation of Tagalog as the official language, and a kind of pidgin Spanish

known as Filipino-Spanish or *español de cocina* ('kitchen Spanish') is widely used.

**History.** Magellan (q.v.) arrived at the P. I. in 1521, and in 1571 Spain took final possession of the archipelago; but after nearly 4 centuries of misgovernment and unrest, and following on the revolt of 1896, in which Rizal (1861-96) and the 'Young Filipino' party played the prominent part, the is. were lost by Spain to the U.S.A. as the result of the war of 1898-1901. After the re-estab. of the civil courts and civil municipal govts. at the conclusion of the Sp.-Amer. war, a Philippine Commission of five members was appointed by the Amer. president in 1900 to determine the legislative functions of the central gov. at Manila. In 1907, after the completion of the census, a popular assembly of Filipinos was opened at Manila. Later the P. I. were governed by a governor-general, appointed by the U.S. president, assisted by a Cabinet of 6, of which 5 had to be Filipinos. After the cession to the U.S.A. the progress of the Filipinos was rapid, and in 1934, as indicated above, the U.S.A. promised to give independence to the is. Then, however, came the Second World War and with it, in 1941, the invasion of the P. I. by the Japanese.

When Guam and Wake Is. were lost by the Amers. in Dec. 1941 their chance of reinforcing the P. I. in the face of Jap. naval and aerial superiority became remote. In any event Amer. experts had, before the war, long been doubtful about their ability to defend the is. in view of their remoteness from the main Amer. bases, and, moreover, the possibility of strengthening their permanent defences before 1937 was prohibited by the treaty of Washington, and the early abandonment of Amer. control was contemplated in the Act of 1934, which provided for full Filipino independence in 1946. The Amer. policy was in fact one of deliberate withdrawal from an advance base, which was generally held to be indefensible. This policy had to some extent been modified after 1935 by Gen. MacArthur (q.v.), who took command of the archipelago in that year and held such pronounced views on the possibilities of defence that 2 years later he retired from the Amer. Army and began to build up a strong Filipino force against the day when the Amer. garrison should be evacuated. As Jap. penetration pressed southward into Fr. Indo-China and Amer. policy began to stiffen against further aggression, the weight of MacArthur's opinions began to make itself felt, and he was recalled to take command of the forces in the Far E., and the garrison of the P. I. was strengthened with considerable reinforcements during 1941. The Japanese attacked the P. I. on 9 Dec. 1941. For details of military and naval operations see PACIFIC CAMPAIGNS IN SECOND WORLD WAR; see also MANILA.

See E. H. Blair and J. A. Robertson, *The Philippine Islands and their People, 1493-1898, 1903-9*; J. Blount, *American Occupation of the Philippines, 1913*; L. H. Fernandez, *The Philippine Republic*,



1926; Z. M. Galang, *Encyclopaedia of the Philippines*, 6 vols. (Manila), 1930; G. A. Malcolm, *The Commonwealth of the Philippines* (New York and London), 1936; H. W. Krieger, *Peoples of the Philippines* (Washington), 1942; J. R. Hayden, *The Philippines: a Study in National Development* (New York), 1942; K. S. Latourette, *A Short History of the Far East*, 1946; and D. Bernstein, *The Philippine Story*, 1947.

**Philippopolis**, see PLOVDIV.

**Philippus**, name of 5 kings of Macedonia. The most famous were: 1. *Philip of Macedon* (382-336 BC). Upon the death of his brother, Philip obtained the gov. of Macedonia, first as guardian to his infant nephew Amyntas, but a few months later he assumed the title of king. Once firmly estab. on the throne he introduced important military reforms, and resolved to obtain possession of the various Gk cities. Demosthenes endeavoured to rouse the Athenians to their danger, but they did not adopt any rigorous efforts to check the progress of the Macedonian king. He subdued the Phocians and was rewarded with the place of the latter in the Amphictyonic Council (346 BC). The Athenians at length became thoroughly alarmed, and they resolved to oppose him. Through the influence of Demosthenes they formed an alliance with the Thebans, but their united army was defeated (Aug. 338) in the decisive battle of Chaeronea, which put an end to the independence of Greece. Philip now determined on war with Persia, but in the midst of his preparations he was murdered by a youth named Pausanias. He was succeeded by Alexander the Great. See D. G. Hogarth, *Philip and Alexander of Macedon*, 1897.

2. Son of Demetrius II (reigned 221-179 BC). During the first 3 years of his reign he conducted a war against the Aetolians, and afterwards engaged in 2 wars with the Romans. The first lasted from 215 BC, when he concluded an alliance with Hannibal, to 205. The second commenced in 200, and was brought to an end by the defeat of P. by the consul Flamininus at the battle of Cynoscephalae in 197.

**Philippsburg**, Ger. tn in the Land of Baden-Württemberg (q.v.), 45 m. NW. of Stuttgart (q.v.). Pop. 4000.

**Philippus, Marcus Julius**, name of 2 Rom. emperors, father and son, of whom the former reigned AD 244-9. He was an Arabian by birth, and rose to high rank in the Rom. army. He obtained the empire by the assassination of the third M. Antonius Gordianus. He was slain near Verona, either in battle against Decius (q.v.), or by his own soldiers. His son, whom he had proclaimed Augustus 2 years before, perished at the same time.

**Philips, Ambrose** (c. 1675-1749), poet, b. Shropshire. He was educ. at St John's College, Cambridge, and his first printed work is a copy of Eng. verses in the collection pub. by that univ. in 1695. A performance was given at Drury Lane, in Feb. 1712, of his tragedy *The Distrest Mother*, which, although little more than a trans. of the *Andromaque* of Racine, was

received with great applause, and long continued to be presented. A short time before, P.'s trans. of Sappho's *Ode to Aphrodite* had been printed in the *Spectator* (No. 223). But Pope and others contrived to bring him into ridicule, and the public were taught to call his poetry 'namby-pamby,' a name probably first bestowed by Henry Carey, the author of 'Sally in Our Alley' and *Chrononhotonthologos*. P. produced 2 more tragedies, *The Brilon*, 1722, and *Humphrey, Duke of Gloucester*, 1723. He next engaged in a periodical paper called *The Freethinker*, in which one of his associates was Dr Boulter: he was almost certainly the chief contributor to *The Grumbler*, 1715. See S. Johnson, *The Lives of the Poets*, 1779.

**Philips, or Phillips, James Orchard**, see HALLIWELL-PHILLIPS.

**Philips, John** (1676-1709), poet, b. Bampton, Oxon., son of an archdeacon. He was educ. at Winchester and Oxford. His poem *The Splendid Shilling*, 1703, is a happy parody of Milton's style. The poem *Cyder*, 1708, is his chief work, but that on the battle of Blenheim, 1705, is of no great merit.

**Philips Works**, see EINDHOVEN.

**Philistia**, in anc. geography, the name for a dist. on the Mediterranean coast, stretching from Jaffa to the desert S. of Gaza. It was occupied by the Philistines (q.v.). Gaza, Ashdod, Gath, Ashkelon, and Ekron were 5 centres of gov., each under its own prince.

**Philistine**, term of contempt or reproach used in England at the beginning of the 17th cent. Later it became applied to persons whom the more enlightened or cultured considered beneath them in taste and intellect. Carlyle and Matthew Arnold in the 19th cent. used it frequently, having taken it from the Germans, with whom it denoted an impenetrable prosaist.

**Philistines**, people often mentioned in the Bible (*Philistini*), where they are said to be of Hamitic stock (Gen. x. 14). They originated from Caphtor (Amos ix. 7), commonly supposed to denote Crete, but Caphtor (Egyptian, *Kefiu*) included the former Cretan dependencies in the Aegean and Ionia. They are first mentioned (as Peleset or Palesati or Purasati) in the Egyptian records at Medinet Habu, as the chief tribe of the 'Peoples of the Sea,' who invaded Egypt, but were heavily defeated by the reigning Pharaoh, Rameses III, in 1194 BC. They settled, perhaps before the Israelite invasion, on the SW. maritime plain of Canaan, the Plain of Philistia (q.v., and see Joel iii. 4, etc.). They gave their name to the whole country of Palestine (q.v.). The adjective 'uncircumcised' in the Bible marks them off from their Semitic neighbours. Their language, too, was not Semitic (Neh. xiii. 24). Their chief god, Dagon, was a corn-deity well known in Syria and Palestine. The idea that he was a 'fish-god' is based on a mistaken etymology. The armour of the Philistine giant Goliath, 1 Sam. xvii, was of bronze and iron; the P. managed to maintain monopoly of iron until the reign of Saul (1 Sam. xiii. 19-22). Their power was

broken by David, who formed them into his *élite* guards, the Cherethites and Pelethites (2 Sam. viii. 18). Very little is known of P. culture, since their main cities continued to be occupied in subsequent ages, and have not yet been sufficiently excavated. Their political system was apparently a federation of city states, of which there were 5, the Pentapolis see PHILISTIA.

**Phillimore, Sir Robert Joseph** (1810-85), jurist and politician, b. London. He wrote *Commentaries on International Law*, a treatise on the law of domicile, and ed. the 9th ed. of Richard Burn's *Ecclesiastical Law*. He was Liberal M.P. for Tavistock and a friend of Gladstone. He became a high court judge.

**Phillip, Arthur** (1738-1814), naval officer and first governor of Australia, his name being perpetuated in Port Phillip Bay, Victoria; b. London. As Capt. P., in 1786, he took out from England a small fleet carrying about 705 convicts for 1887. But he considered the spot ill-suited for a settlement and selected a place to the N. of it which seemed to him to have the necessary qualifications, and, on 26 Jan. 1788, the Brit. flag was hoisted at Port Jackson, thus marking the beginning of the Brit. occupation of Australia. With convicts and their guards P. founded New S. Wales colony, the success of which he never doubted. A national memorial on the wall of St Mildred's Church (of which only the tower remains), Bread Street, London, unveiled by the Duke of Kent in 1932, commemorates the fact that P. laid the foundation of the colony which became the commonwealth of Australia.

**Phillips, Edward** (1630-c. 1696), poet, nephew of John Milton, b. Westminster. His great work is the *Theatrum poetarum*, 1675, a complete collection of ancient and contemporary poets, with observations upon them. The work contains criticisms far above the contemporary national taste. Other works attributed to P. are *Enchiridion linguae latinae*, 1684, and a poem on the coronation of James II.

**Phillips, John** (1631-1708), Eng. poet and author, brother of Edward P., b. Bampton, Oxon. His chief works, which are remarkable for licentious and coarse wit, pungent satire, and a generally controversial scurrility, are *A Satyr against Hypocrites*, 1655, *Montielion, or the Prophetic Almanack*, 1660, *Maronides, or Virgil Travesty*, 1673, which like some of his other works is in the style of *Hudibras*, *The Augustus Britannicus*, 1697, and *The Vision of Mons*, 1706, in addition to numerous trans. from Greek, Latin, and French. An early life of Milton, his uncle, is attributed by some to P. See W. Godwin, *The Lives of Edward and John Phillips*, 1815, and Helen Darbishire, *The Early Lives of Milton*, 1932.

**Phillips, John** (1800-74), one of the most distinguished of early geologists of England, b. Marden, Wilts; nephew of William Smith (q.v.) 'the father of English geology', who brought up P. after the death of his parents. Assisted his uncle

in preparing his geological maps of England. He was prof. of geology at King's College, London, from 1834 to 1840, when he resigned to serve on the geological survey of Great Britain under De la Beche. In 1844 he became prof. of geology in Dublin Univ. and later a reader in geology at Oxford. Was appointed Keeper of the Ashmolean museum 1854-70. In 1864 he was elected president of the Brit. Association. P. made a special study of Liassic crustacea, Oolitic saurians, and Wenlock shales. He wrote numerous works on geology, including *Illustrations of the Geology of Yorkshire*, 1835; *Geology of Oxford and the Thames Valley*, 1871; besides *A Geological Map of the British Isles*, 1842, and *Memoirs of William Smith, the Father of English Geology*, 1844.

**Phillips, Morgan Walter** (1902-), political organiser, educ. at a S. Wales elementary school, and at the London Labour College. After sev. years administrative experience in the Labour party, he became its general secretary in 1944, and as such has played a leading part in its election re-organisation since that date.

**Phillips, Stephen** (1864-1915), poet and playwright, b. Summertown, near Oxford. His mother was related to Wordsworth, and Laurence Binyon (q.v.) was his cousin. P. was educ. at King's School, Peterborough, and Oundle. He studied for the Civil Service, but instead became an actor in Frank Benson's company, where he remained from 1885 to 1892, but was not a success. He came into prominence with the striking poem *Christ in Hades*, 1897; and with his *Poems*, 1898, which was awarded the thousand-guinea prize of the Academy, he estab. a reputation which lasted 10 years but has not been sustained since. He revived poetic drama with his *Paolo and Francesca*, 1900, from which at one time he drew royalties of £150 a week. Later verse plays received with acclamation were *Herod*, 1901, *Ulysses*, 1902, and *Nero*, 1906. But his range was very limited, and he now passed into a period of obscurity, from which he emerged only to produce such inferior dramatic work as *The King*, 1912, *Armageddon*, 1915, and *Harold*, 1927. His *New Poems* appeared in 1908 and *Panama* in 1915. From 1913 to his death he ed. the *Poetry Review*.

**Phillips, Walter Joseph** (1884-), Canadian artist of Brit. descent, b. at Barton-on-Humber, England, and educ. in Birmingham. He first exhibited at the Royal Academy in 1913, and in the same year emigrated to Canada, settling in Winnipeg. Here he began the art of colour-woodcut, and his sense of colour and originality of design and pattern made him well known in Europe and America. He pub. 2 portfolios of his woodcuts, and also *The Technique of Colour Woodcut*, 1927.

**Phillips, Wendell** (1811-84), Amer. reformer and orator, b. Boston. He gave up a legal practice to devote his time to the abolition of slavery, and he was regarded as the prime orator of the movement. In 1840 he was sent by

Massachusetts to the World's Anti-Slavery Convention. His *Speeches, Lectures, and Letters* were pub. at Boston (1863 and 1891). See lives by G. L. Austin, 1884, and C. Martyn, 1890.

**Phillipsburg**, tn in Warren co., New Jersey, U.S.A. It manufs. metal products, chemicals, clothing, cement, bobbins, silk, and machinery, and has iron foundries. Pop. 18,920.

**Phillipsite**, greyish translucent mineral, the primary form of which is a right rhombic prism. It consists chiefly of silica and alumina.

**Phillipotts, Eden** (1862- ), Brit. novelist and playwright, b. Mount Aboe, India; eldest son of Capt. Henry P. (15th Native Infantry), political agent for the states of Harrowec, Rajputana. Educ. at Plymouth, P. became a clerk in the Sun Fire Insurance Office, 1880-90; and then, after studying for a time for the stage, adopted literature as a profession. In his novels P. gives a vivid and often depressing picture of Devonshire life. His books, which number over 150, include *Lying Prophets*, 1896, *The Human Boy*, 1899, *The Good Red Earth*, 1901, reissued as *Johnny Fortnight*, 1904, *My Devon Year*, 1903, *The American Prisoner*, 1904, *The Secret Woman*, 1905, dramatised 1912, but banned by censor, *Portreeve*, 1906, *The Folk Afield*, 1907, *The Mother*, 1908, dramatised 1913, *Widcombe Fair*, 1913, *The Judge's Chair*, 1914, *A Shadow Passes*, 1918, *The Bronze Venus*, 1921, *Redcliff*, 1924, *Tryphena*, 1929, *Essays in Little*, 1931, *Bred in the Bone*, 1932, *Portrait of a Gentleman*, 1934, *Woodnymph*, 1936, *Portrait of a Scoundrel*, 1938, *Goldcross*, 1940, and *Pilgrims of the Night*, 1942. *The Farmer's Wife*, 1917, *Yellow Sands*, 1926, in which his daughter Adelaide collaborated, and *Buy a Broom*, 1929, are plays. The novels of P. are mostly of Devonian life and character, and the local atmosphere in them is detailed and true, so that they have been compared with Hardy's Wessex tales. But he reached the zenith of his career with the play *The Farmer's Wife*, a somewhat old-fashioned comedy with a simple plot and homely scenes which enjoyed a phenomenal run in London and in the Provs.

**Philo, Quintus Publilius**, Rom. gen. During his consulship (339 BC) he defeated the Latins, and was appointed in the same year dictator, when he passed the *Leges Publilianae* according to which one consul must be a plebeian. During his second consulship (327) he carried on war in S. Italy, and during this third (320) he fought against the Samnites.

**Philo Judaeus**, or **Philo (Philon)** the Jew (b. c. 20-10 BC), Graeco-Jewish philosopher, exegete, and apologist; a native of Alexandria. Though a Jew by birth, his studies were mainly in Gk philosophy. He was especially familiar with the writings of Plato, upon whose language his own is closely modelled; and it is for his attempt to reconcile Platonic philosophy with the Mosaic revelation that he is particularly famed. P. adapted the pantheistic form of the Logos as taught

by the Stoics, drawing a sharper distinction between the Logos and the world; and his influence is manifest in such scriptural Books as Wisdom, the fourth gospel, and Heb. The only event in P.'s life to which it is possible to attach a date is his membership of the embassy to Galus in AD 40. The best ed. of P.'s collected works is that of L. Cohn and P. Wendland, 8 vols. (1930). There is also a text with trans. by F. H. Colson and G. H. Whittaker (Loeb Library, 1929-50). See E. R. Goodenough, *By Light, Light: the Mystic Gospel of Hellenistic Judaism*, 1935; *The Politics of Philo Judaeus*, 1938; *An Introduction to Philo Judaeus*, 1940.

**Philoctetes**, friend and armour-bearer of Heracles, who left him his bow and poisoned arrows. On his way to the Trojan war, P. stayed at the is. of Chryse, where he was either bitten in the foot by a snake or wounded by one of the poisoned arrows. At all events, the wound gave off so intolerable a stench that P. was abandoned by the Greeks on the coast of Lemnos. There he remained until the tenth year of the war, when Ulysses and Diomedes came to fetch him to Troy, as an oracle had declared that the city could not be taken without the arrows of Heracles. On arrival he was cured by Aesculapius. See the *Philoctetes* of Sophocles; family *Araccae*.

**Philodendron**, ornamental climbing shrubs with ovate, oblong, heart- or arrow-shaped leaves; natives of tropical America, of which *P. andreaeanum*, *P. erubescens*, *P. fragrantissimum*, *P. serpens*, and *P. verrucosum*, a dwarf plant, are exceptional for humid, heated green-houses.

**Philology** (Greek and Latin *Philologia*) may have various meanings. In classical times it could have either a comprehensive meaning (this included linguistics, historical and ethnic conditions, etc.) or the meaning 'love of discussion.' The term had a different meaning in the Middle Ages and in the Renaissance period. In the present time its meaning in England is not the same as that on the Continent. Here the term is taken as indicating the origin, growth, and relation of literary languages. In this respect it is strictly related to 'linguistics' (q.v.), and has a wide range of meaning. In a strict sense, P. may indicate the study of written documents and literary works, and particularly of their language, its aim being to obtain from all these documents all possible information regarding the development of the language in question, and of its relationship with other languages: this special field is known as **Comparative P.**

Gk and Lat. P. was developed to a high degree of excellence in the 14th and 15th cents. in Italy; in the 16th cent. in Holland, France, Germany, and Spain; in the 18th cent. in England (with R. Bentley at Trinity College, Cambridge, R. Porson, and R. Wood). In the 19th cent. Germany became the centre of P. Ger. P., one may say, arose in the 18th cent. in Holland; in the 17th cent.,

in England, George Hickes (1642-1752) became the 'father' of A.-S. P. Semitic scholars followed a similar method in dealing with the Semitic languages then known, such as Hebrew, Arabic, Ethiopic. However, until about 150 years ago P. as an exact science was still in its infancy. During the second half of the 18th cent. Sanskrit (q.v.) began for the first time to attract the attention of European scholars: the Fr. Jesuit Cœurdoux, in 1767, and Sir Wm Jones, in 1786, pointed out certain resemblances between Sanskrit and some European languages, especially anct Greek and Latin. At the time it was no more than a brilliant conjecture, but in 1816 the Ger. prof Franz Ropp pub. a comparative grammar of the Sanskrit, Gk, Lat., Persian, and Ger. languages; with it comparative P. may be said to have begun.

A century ago, 'when the archaeology of the Near and Middle E. was still in its swaddling clothes,' there were already good dictionaries and grammars of various Indo-European, Semitic, and other languages. After the discovery and decipherment of the numerous Egyptian, Assyro-Babylonian, Hittite, Phœnician, S. Arabian, and other inscriptions, philologists began to apply scientific methods in the compilation of grammars and dictionaries of these anct tongues. To-day many extinct languages, belonging to different linguistic families (q.v.), are nearly as well understood by competent scholars as archaic Greek, Latin, or anct Hebrew. Others, however, such as Hurrian, are still little known because there are not sufficient written documents. See also LANGUAGE; LANGUAGE, ORIGIN OF; LANGUAGES, CLASSIFICATION OF; LINGUISTIC FAMILIES; LINGUISTIC SCIENCE; INDO-EUROPEAN LANGUAGES.

**Philomela**, mythical daughter of Pandion, King of Athens. She was dishonoured by Tereus, King of Thrace, the husband of her sister, Procne, and had her tongue cut out so that she could not reveal the fact. But P. wove words into cloth, and Procne, learning the truth, slew her son Itys and served him up as a meal to the king. Tereus pursued the sisters, who were changed, one into a swallow, and the other a nightingale, while Tereus became a hoopoe.

**Philomena**, Saint, young woman whose cult had much vogue in the 19th cent. after the discovery in 1802 of relics, in the catacomb of St Priscilla, with a broken tablet inscribed *Philomena, Pax tecum*, leading to the belief that the body was that of an unknown martyr. It would seem, however, that the church of St Praxedes in Rome already contained the relics of the real St P. Her feast is on 11 Aug.

**Philon the Jew**, see PHILO JUDAËUS.

**Philopoemen** (252-182 BC), Gk statesman and patriot, b. Megalopolis, Arcadia. He defended his native city against the Spartans (222), and, joining the Macedonian king, Antigonus, defeated the enemy at Sellasia (221). In 210 he was appointed gen. of the Achaean horse, and in 208 was raised to the position

of *strategos*. After his victory over the Spartans at Mantinea (208) he was proclaimed liberator of Greece, and in 192 again defeated the Spartan army under Nabis. In 182 he was taken prisoner by the Messenians and compelled to drink poison.

**Philosopher's Stone**, see ALCHEMY.

**Philosophy**, term of which the meaning has in the course of cents. undergone considerable modifications. Pythagoras is reputed to have been the first to use it, replying to Leon's question as to his vocation that he was a 'philosopher,' that is, a lover of wisdom (*philos* and *sophia*). No kind of knowledge was in those early days outside the scope of P., which comprehended the whole range of human interests. This is seen in the Stoic definition of P. as the endeavour after theoretical and practical perfection in the depths of logic, physics, and ethics. Plato, in the *Euthydemus*, declares that P. is concerned with the ideal alone, and is identical with wisdom, whilst Aristotle uses the word sometimes to embrace all science, and sometimes as equivalent to the science of being (ontology). In the days when it was possible for the great minds of the world to be pre-eminent, not only in one or two but in most of the depths of science, the philosopher could formulate his system of P. from his own first-hand knowledge and experience. All knowledge was thus taken by P. to be her prov., and a philosopher, so called, was very often an expert in the various sciences. Such a state of things was only possible while science was in a very rudimentary condition, and with the growth of specialised knowledge P. could no longer include, though it still retained the claim to transcend in importance, all knowledge. In this sense the scholastics and neo-scholastics define P. as 'the knowledge of things through their highest (i.e. most universal and independent) causes.'

Before the more modern definitions of P. are mentioned, a brief answer may be given to the old query, 'What is the good of P.?' From the time of Aristophanes onwards the philosopher has been represented as unpractical, immersed in useless and chimerical speculations. But as Aristotle remarked, in order to prove that P. is vain and illusory we are compelled to philosophise. The sceptic is as much a philosopher as the idealist. There are experts in the special sciences who sometimes decry P., yet tread upon philosophical ground while pursuing their most abstruse inquiries. Mathematics is ultimately concerned with the questions of time and space, physics with matter and energy, art with beauty, ethics with virtue, etc. P. is thus seen to be a necessity of human nature; the pursuit of speculative truth has always engaged men's minds, although there have ever been those to say that the end was unattainable. It is not so much the end as the pursuit that is important. An understanding of what is meant by the term P. in present-day usage is a necessity to a thorough study thereof, but unfortunately this is by no means an easy matter.

Hardly any two writers are agreed as to the definition and boundaries of P., and the word has different connotations in different countries. Kant defined philosophical knowledge as knowledge through conceptions, as such; Herbart defined P. as the working out of concepts, and divided it into 3 depts, logic, metaphysics, and aesthetics (including ethics). Comte and Spencer regarded P. as the unification and classification of the various sciences with a view to merely material ends. In the Eng. language, until very recently, P. meant almost anything, as evidenced by the term 'natural philosophy,' used by physicists. When properly used in the wider sense, P. may be taken to include logic, ethics, aesthetics, metaphysics, ontology, cosmology, and psychology; political economy and the 'philosophies' of law and hist. are often included. All these subjects are closely related to P. although not included in the narrower use of the word.

The most noteworthy advance in modern times has been that of psychology, which is now generally studied separately from P., and which, it is claimed by some, should be treated entirely as a physical science. The bearing on psychological investigations of the theory of knowledge, and the peculiar characteristics of 'mind' as a study, render it desirable for psychology to be retained as a dept of P., although distinct from and subordinate to the higher branches. Logic, ethics, and aesthetics, whilst also forming part of P., differ from the other depts in being 'normative' sciences, having reference to the 'norms,' or standards, respectively of truth, virtue and beauty. For the purposes of this general outline of the progress of philosophical thought, P. will be taken to include epistemology, or the theory of knowledge, metaphysics, and ontology. The ultimate task of P. is to show the interconnection of the sciences and their ramifications as part of an organic whole, which constitutes the totality of knowledge. Some idea of the steps in the fulfilling of this task may be gained from a knowledge not only of the philosophers themselves, but of their indebtedness to and connection with one another.

The beginnings of P. are as a rule attributed to the Greeks, but the Indian ideas of the 6th cent. bc and later form an interesting parallel philosophic development. The Upanishads, whose main thesis is the monistic idea of the one true Absolute (Brahman or Paramatman), preceded the 6 philosophical systems. These are the *Nyaya*, the *Vaisheshika*, the *Sāṅkhya*, the *Yoga*, the *Mīmāṃsā*, and the *Vedānta*; they all are based upon a monism, expressed in a more or less poetical manner. In contrast to these declining oriental civilisations, the culture of the Greeks was only in process of formation.

Gk P. may be divided into 3 sections: a physical or cosmological period, dealing with questions of being (c. 600-450 bc); a humanistic or ethical period, dealing with the ethical and social relations

of man (450-400 bc); and a systematic period, during which all human problems were first connected in thought into a whole (400-300 bc). The problem of the early Gk philosophers was to find the ultimate form of the objects of external perception. Thales thought that water was the source of all things; Anaximenes that it was air; and Anaximander, chaos. The Pythagorean P. had for its general principle number: the organisation of the universe in its various relations is a harmonious system of numbers. The Eleatic school, of which Parmenides was the real head, asserted that there was in reality no change or movement in the universe. The riddles of movement of Zeno (Achilles and the tortoise, etc.) had much influence on the conclusions of the Eleatic school. These conclusions were challenged by Heraclitus, who taught that 'everything is in a state of flux' (*panta rhei*) and that the permanence of things is only apparent. Empedocles attempted to combine the Eleatic principle of 'being' with the 'becoming' of Heraclitus. Democritus, the main author of the atomist theory, was the next noteworthy philosopher of Greece; he may be said to have laid the foundations of modern physics and cognate sciences, and is the earliest philosopher who attempted to give a scientific explanation of the world. Anaxagoras was the last philosopher of the early period; and his doctrine of *nous*, mind, as the omnipotent, omniscient, and harmonising power is the first teleological explanation of the universe. The Sophists were the first philosophers of the second Gk period, although they were in reality a professional class who came forward to meet the growing demand in Greece for knowledge. The founder of the school is usually considered to be Protagoras, whose fundamental thesis consisted, in modern language, of the denial of all objectivity, and the restriction of knowledge to the impressions of the individual. His famous dictum was 'Man is the measure of all things,' and he may be called the first of the individualists. Other prominent names among the Sophists are Gorgias of Leontini, Prodicus, Hippias, Polus, Thrasymachus, etc. The Sophists were generally teachers of rhetoric and eloquence, and during this period P. underwent a change in character. Problems of an ethical nature were discussed more, and, as a result of the prevalent doubts of the existence of any universally valid truth, scepticism (q.v.) was the prevailing note. Hence the title Sophist is still used in a disparaging sense, but there is no doubt that they did some good in fostering culture and promoting intellectual activity. The philosopher who was instrumental in refuting the arguments of the Sophists and rehabilitating P. was Socrates. Of his P. we possess no record written by himself, as he never left any; his life and P., as revealed in the *Dialogues* of Plato, are inseparable. He based conduct on knowledge; to know oneself is the sum of all P. and the only pursuit worthy of man. He founded no special

school of P., though he gave the starting-point to sev. lines of thought. The minor or imperfect Socratic schools, as they are termed, are 3: the Megarian, the Cyrenaic, and the Cynic. The originator of the first was Euclid of Megara, and his system combined Socratic ethics with the 'One-being' doctrine of Parmenides. The Cyrenaic school, founded by Aristippus, was the forerunner of the Epicureans, and held that pleasure was the only good, though not such pleasure as would be followed by pain. The sect of the Cynics was founded by Antisthenes, who declared virtue to be the only thing worth living for; virtue was, however, defined as abstinence and asceticism. Diogenes of Sinope is the famous example of a Cynic philosopher. The last epoch in Gk P. is a landmark in the hist. of human thought. In the two great names of this period, Plato and Aristotle, the thought of all preceding ages reached its culmination. In their union and contrast they form the two poles of thought around which the human search for truth still revolves. Plato is occupied mainly with an inquiry as to the necessary and universal element in experience: he represents the synthesis of pre-Socratism and of Socratism. We are indebted to Plato for 2 great truths: that, in order to direct human knowledge aright, reason must be the starting-point, and that all human thinking is accomplished by means of universal concepts. The doctrine of universal ideas has had a great influence on the hist. of P., and is now an important factor in every philosophical system. Aristotle may be called the founder of empiricism in the ant. world. Plato placed P. in an idealistic antithesis to actuality, and a more realistic conception of things was supplied by Aristotle. There are 2 essential elements to be considered in a rational examination of the world, the *hulē*, or matter, and the form which may be given to it by human intelligence. Aristotle was called the philosopher by medieval schoolmen, and his work certainly far surpasses, both in character and amount, that of his predecessors. His logical treatises, his ethics, and his psychology served for ages as standard treatises on the various depts of P.

During the Rom. period there were, from a philosophical point of view, 2 main periods, a moral and a religious. The 3 main systems of the first period are Stoicism, Epicureanism, and Scepticism. The first teaches that happiness is to be found not in outward things, but in power over 'all thoughts, all passions, all desires.' Epicureanism declares the supreme good to be personal pleasure, consisting not in self-indulgence, but in tranquillity and peace of mind. Total submission is advocated by Scepticism, which declares definite knowledge to be unattainable. The chief names in Stoicism are Zeno, the founder, Panaetius, Posidonius, Seneca, Epictetus, and Marcus Aurelius; in Epicureanism, Epicurus, Metrodorus, Hermarchus, Polystratus, and Apollodorus may be mentioned; Pyrrho of Elis founded the Sceptical

school, of which Arcesilaus and Carneades were the prin. adherents. The religious P. of the Rom. period is known as neo-Platonism. The germ of this teaching is found in the writings of Philo, but the title of founder of neo-Platonism properly belongs to Plotinus, a pupil of Ammonius Saccas. Neo-Platonism is a religious P. with strongly marked mystical tendencies and has more in common with religion than with P. proper. The Gnostics and the Christian Fathers were representatives of faiths which formed the transition from ant. to medieval P. The chief of the Gnostics were Basilides, Carpocrates, Valentinus (Alexandrian Gnostics), and Menander, Saturninus, Tatian, and Bardesanes (Syrian Gnostics); among the Fathers may be mentioned Justin Martyr, Athenagoras, Theophilus, Clement of Alexandria, Origen, Athanasius, and St Augustine. The latter based their P. on Platonic illumination as the most 'spiritual' of the Gk P.s, but they had some trouble with those elements of Plato's system which seemed to conflict with Christian dogma, e.g. the eternal existence of matter. It was St Augustine who really 'christened' Platonism.

The first representative of medieval or scholastic P. was John Scotus Erigena. The great problem over which the battles of the Schoolmen were waged was Nominalism versus Realism. The Nominalists, who followed Aristotle, maintained that universal notions are mere abstractions of the mind, having no objective reality. The Realists, following Plato's teaching, contended that universal notions have a real existence prior to the concrete things which embodied them. An intermediate theory, which sought to unite the two systems, was called Conceptualism, which was finally superseded by the moderate realism of the Thomists. The chief figures among the earlier scholastics are Roscelin, the nominalist; Abelard, the dialectician who foreshadows the moderate realism mentioned above; Anselm, his adversary, a pioneer in medieval psychology; and William of Champeaux, the extreme realist. Albertus Magnus, 'the Universal Doctor,' introduces the urge to thorough-going synthesis, which found its perfection in the writings of St Thomas Aquinas and was continued by the Thomists. In contradistinction to these a Franciscan school, headed by Alexander of Hales and St Bonaventure, continued the 'mystic' (neo-Platonic) tendencies of the Victorine school of the 12th cent. A veneer of Aristotelian logic was given to their doctrines by Duns Scotus, after whom the Scotists are named. Thereafter came the slow decline of Scholasticism, which by the time of the Reformation had ceased to be a vital force in the world of P. During the period of the Renaissance, the intellectual movement which marked the transition from the Middle Ages to the modern world, nearly every system of ant. P. was revived, and the resulting intellectual activity found expression in the writings of the philosophers of the 'transition period.' Chief among these was Giordano Bruno, the

Italian, whose system is a pantheism which had much influence on Spinoza. Jakob Boehme and Montaigne represent respectively mystical theosophy and scepticism, whilst Bacon and Hobbes showed the defects of the existing methods of research and inquiry, the latter emphasising the importance in science of deduction, to which Bacon did not ascribe any importance.

Modern P. is generally regarded as commencing with Descartes. The first phase of modern thought is scientific Rationalism, which appealed to the reason, by which such mighty results were being obtained in natural science. From Descartes to Leibnitz there is a period of metaphysical systems which have a close connection with science. This Rationalism, however, assumed a harsh, narrow aspect. Reason was deified, and represented as the all in all, and Deism took the place of religion. The gradual undermining of Rationalism was due to the efforts of the Empiricist school, which argued that experience is the source of all knowledge. Scepticism succeeded Empiricism, but was itself discredited by the new movement, started by Rousseau, Lessing, and Herder, which grew into what is known as Ger. Idealism. This in its turn was supplemented by the theories of Schopenhauer, Spencer, and others. Descartes's system was idealistic and dualistic: the world falls into two completely separated realms, the one of body and the other of mind. Behind this dualism, however, is the conception of deity, the one perfect substance in which both realms meet. The manner in which this union is brought about was not satisfactorily explained by the parallelism of Descartes. Goulinx attempted to overcome the difficulty by his theory of Occasionalism, which attributes all movements, both mental and physical, directly to God; Malebranche is closely connected with this position. Hobbes held that the end of P. was social, and that theology and transcendentalism did not come within its sphere. Spinoza declared the unity of all things in God, mind and matter being equal, both being attributes of the infinite, eternal, and all-comprehending substance which he calls God. Leibnitz was the chief representative of Pluralism in metaphysics, regarding individuation as an irrefragable truth. His system was in all respects the logical antithesis of Spinoza's, and made an immediate and widely extended impression on the culture of Europe, which it dominated until the time of Kant. Wolff was the first follower of Leibnitz who erected an independent system on his principles; he attempted to combine the teaching of Leibnitz with the older Aristotelian doctrines of the schools. Among the pupils of Wolff who influenced Kant were Baumgarten and Crusius. Locke may be called one of the founders of modern psychology; his P. is a study of ideas. The influence of his writings on the subsequent course of philosophic thought has been very great, and his principles were developed in the hands of Berkeley,

Hume, Reid, and the so-called Scottish psychological school, and afterwards in those of the Fr. sensationalist and materialist school, including such names as Condillac, Helvétius, Diderot, and d'Holbach.

Kant was the pioneer of a line of thought leading again to those wider issues as to the meaning and constitution of reality treated of by Plato and Aristotle. He created a new dualism between the phenomenon and the noumenon. The development of Idealism was carried on by Fichte and Schelling. The line of thought pursued by Kant, Fichte, and Schelling culminates in Hegel. The diverse elements of thought, subject and object, individualism and pantheism, which previous P.s only partially reconciled, are now taken up and fused into one system. The two elements of knowledge which Kant had left unreconciled, and which Fichte and Schelling harmonised only by suppressing one of the sides, were brought into a synthesis. The ultimate principle of all knowledge is the unity of consciousness. Hegel's system must be regarded as the culmination of Ger. Idealism. 'Mountains of dust and rubble and millions of graves testify to-day to the fatal character of such one-sided historical thinking as that of Hegel' (Douglas Jerrold). Of the philosophers since Hegel, Schopenhauer was a pessimist who regarded life as essentially evil; his chief tenet is that the inner essence of man's nature is will. The Positivism of Auguste Comte is in reality a denial of the utility of P., save as a classification of the different sciences. In its later form Humanity as a whole was worshipped as the mediator between the outer world and man. The Utilitarianism of the Benthamites and J. S. Mill, though based on an individualistic and hedonistic theory, was at bottom social in its nature. The theory known as psycho-physical parallelism was taught by Fechner and Paulsen. The doctrine of evolution inspired by the P. of Spencer may be described as the creed of the Unknowable. Among other modern systems of P. that of Lotze is teleological in nature, combining the monadology of Leibnitz with the pantheism of Spinoza, and has had much influence on Amer. thinkers.

It may be said that modern P. is divided into two main sections, of which the one maintains and the other denies that matter and spirit can be reconciled in a manner comprehensible to the human reason. On the latter side are the Positivist, the Kantian, the theolo-  
nistic, and all the allied schools. —  
on the former side are the Theist, the Idealist, the Spiritualist, and their followers and allies.

One of the chief tendencies of present-day P. is to seek to establish a closer relationship between P. and the sciences. But in order to complete this movement, it is necessary to define more clearly just where the physical conception of the universe stops and the philosophical perception of the universe as a whole begins. Students to-day already recognise that the

physical conception of the universe does not allow for the degree that time relations as well as space relations affect it. Indeed, physical science is not to be regarded as an attempted interpretation of reality, but only as a means of conducting tests and investigations to support theories of reality. Conscious behaviour and life elude the physical scientist, as was the case with Newton, and a perception of the universe is dependent on life and consciousness. For that very reason different scientific interpretations reveal inconsistencies, and it is precisely these variations that P. must endeavour to interpret and bring to agreement. Thus P. confines itself to actual experience, including not only present, but past and future, in any aspect which may reveal some new postulation in its endeavours to interpret reality, and this in part explains the growing return to realism as opposed to a materialistic theory founded on physical interpretations. A valuable contribution to the philosophical literature of the present time has been made by Prof. S. Alexander. It may perhaps be described as the first system of P. yet propounded by a British philosopher. Alexander declares that space and time are real, and that the physical world arises from space and time. He denies that idealism can provide the base upon which reality rests, holding that ideas are merely abstractions from reality, and that with a certain complex element in physical structure life is evolved, or, as he puts it, is 'emergent.' He makes no attempt to explain life away as an elaborate system of mechanism. Similarly a further complex development in the physical structure produces mind. Besides the work of Alexander, the work of J. S. Haldane deserves mention. Haldane thinks that the universe as it is assumed to be in physical science is only an idealised world, while the real universe is the spiritual universe, in which spiritual values count for everything. The group of workers who are in agreement with Haldane include Bradley and Bosanquet of Great Britain, Royce of America, Croce and Gentile of Italy, and Volkelt of Germany. Opposed to their teaching is a school which includes W. James, Dewey, and Schiller, who, from a pragmatic standpoint, propound that experience in conduct gives us 'right,' while experience in thought is 'truth.' They demand that the practical consequences of an idea should be its true measure of value, involving a criticism of a monistic universe, and their demand imports a belief in pluralism (q.v.). In America there is a tendency to refute the idealism of Kant as developed by Hegel, and Bertrand Russell and G. E. Moore have written from that standpoint. In France the P. of Bergson (q.v.) has had a wide following. He is opposed to absolutists, and offers in support of his criticism his doctrine of change as the answer to the riddles of the philosophical world. Croce and James in many respects subscribe to this theory. Bergson's attitude towards evolution is expressed as the universe

being a mind functioning both theoretically and practically; the practical operations produce the materialistic world, while the theoretical manifestations result in the spiritual world. Prominent among Ger. philosophers is Wundt, who died in 1921. His theory is that the body is part of an experience of which the soul is subjective. He proclaims the 'will to believe,' and up to this point is supported by W. James. Impulsive will is imputed to all organisms, and activity is will, and the highest will he calls God. Fr. P. reveals a decided sociological trend, and is conducted rather by way of attempts to solve separate problems than by the formulation of any complete system. It may be that the earlier mathematical studies of some of the leading philosophers like Cournot and Renouvier and the scientific investigations of Bergson and Le Roy produced a more precise method of inquiry, and modern Fr. thought appears to withdraw from the consideration of individualistic systems, declaring that reality is too rich and complex to support that contention. P., it is said, is a manifestation of life itself which blossoms to self-consciousness through grades of increasing harmony.

In France, after 1944, Existentialism (q.v.) gained much attention, its chief exponent being Jean-Paul Sartre. Based on his view that 'all human activities are equivalent, all are destined by principle to defeat,' it conceives of the absolute inanity of existence and negation of all creation, and offers no dogmatic solutions to questions of ultimate origins and destinies. It is not entirely a novel P., and its distinctive features are borrowed from Kierkegaard (q.v.), amongst them that God and exceptional individuals are above moral categories, and that subjectivity is truth, i.e. 'consciousness creates out of itself what is true.' Karl Jaspers (q.v.) upholds the Existentialist contrast between mere existence and significant existing, but stresses the experience of *another* person as a separate other person. Whereas Martin Heidegger (q.v.), whom Sartre follows (but who denies any connection with Existentialism), holds that there is no other, that existence is somehow born from nothing, and also that the possibility of a God and of man's dignity reside in being as such.

The relationship between P. and sociology has a particular interest in these days when the study of social questions appeals to a rapidly growing number of students. Bosanquet suggests that the philosopher reads in society the wider expression of what individual man really is. He investigates the social whole in order to discover in its progress what the mind of society really is and what are its powers of self-assertion or self-effacement in human and natural environment. The state is merely an expression of certain needs and ambitions of man. Bosanquet's theory is based upon Plato's assertion that politics is a science, and that political forms correspond to types of mind, and, further, that the central



inspiration of all science is good, and, finally, in a glorious climax, that no one who has not comprehended the connection that links the order of the universe and its influence upon society is competent to be a ruler of men.

An Aristotelian reaction has shown itself in the neo-Scholastic movement among Rom. Catholic philosophers, fostered by the work of Cardinal Mercier at Louvain, and the study of the works of Aquinas imposed by recent popes upon seminary students. The chief leaders of the movement are Dr Grabmann of Munich, J. Maritain in France, and F. Aveling, M. C. d'Arcy, P. Coffey, and others in Great Britain. The current interest in psychology (q.v.), and its ever-widening appeal to a class of student with little or no previous acquaintance with P. as a science, call for a word of warning. There is a tendency to include all questions associated with the study of the mind under the heading psychology. In most cases the classification is wholly unjustified, and it is only too easy for the student to examine some question which is purely philosophical under the delusion that he is studying psychology. Psychology knows only causes and effects of mental life; it has nothing to do with ideals, values, purposes, and ends except as mere facts. P. is an attempt to get at the deeper reality of things; the significance of human life, the nature of the soul, human destiny, immortality, and God are purely philosophical problems. Psychology examines phenomena. P. seeks to explain.

The large number of philosophical works that followed the break-up of the Hegelian school are alike in that they consist, not in any enthusiasm in speculation for its own sake, but rather in the desire to see how others have speculated, or, in other words, in the hist. of P. Thus many writers of a philosophical bent have acquired a reputation exclusively for their criticisms rather than for any system of P. Among independent philosophers who are better known for their chapters on the hist. of P. are Zeller, Prantl, Sigwart, and also Kuno Fischer, the last-named being no mean constructive philosopher. Even such philosophers as Ernst Reinhold and Chalybäus are known as historians of P. more widely than as expositors of systems of P.; while Trendelenburg's *History of the Doctrine of Categories* is read in Germany far more than his *Logical Investigations*. Indeed, it is remarked by Erdmann that this preponderance of the historical element is seen even in the speculations themselves, especially in the form of critical discussions contained in historical introductions. The only exceptions would appear to be Lotze and Weissie; for such well-known works as Hillebrandt's *Organum of the Philosophical Idea* and Wirth's *Idea of the Godhead* are really sketches of the hist. of P. In this connection it is pointed out by Erdmann that Ulrich has received many compliments for his criticism of the Hegelian P., but that as regards his theory of distinguishing activity he seems to

stand alone; yet he does not think that this marked preference is any indication of philosophical decrepitude and sees an almost conclusive parallel in the effect on the study of the law of the brilliant historical writings of Savigny. There is clearly much gain in having the hist. of P. presented in a philosophical manner; for, just as the study of legal hist. paved the way ultimately for increased study of the law for its own sake, so the study of the hist. of P. may give an impetus to a wider study of P. See also COSMOGONY; ETHICS; LAW; LOGIC; MIND; POLITICS; PSYCHOLOGY; SOCIAL PHILOSOPHY, etc.

See T. Gomperz, *A History of Ancient Philosophy* (trans.), 1901-12; B. Russell, *Problems of Philosophy*, 1912, and *History of Western Philosophy*, 1948; H. Höfding, *Brief History of Modern Philosophy* (trans. by C. F. Sanders), 1912; C. C. J. Webb, *History of Philosophy*, 1915; W. Windelband, *History of Philosophy* (trans.), 1919; J. E. Erdmann, *A History of Philosophy* (trans.), 1921; L. Rougier, *Philosophy and the New Sciences*, 1922; B. Bosanquet, *Meetings of Extremes in Contemporary Philosophy*, 1924; J. Seth, *English Philosophers and Schools of Philosophy*, 1925; E. Zeller, *Outlines of the History of Greek Philosophy* (13th ed.), 1931; M. de Wulf, *History of Medieval Philosophy*, 1926, 1935; J. Maritain, *An Introduction to Philosophy*, 1931; A. N. Whitehead, *Adventures of Ideas*, 1933; C. R. Moore (ed.), *Philosophy—East and West*, 1944; H. Huxton, *Philosophy for Pleasure*, 1949; F. A. Thilly, *A History of Philosophy*, 1952; H. Hiriyaana, *Outlines of Indian Philosophy*, 1952; F. C. Coplestone, *Medieval Philosophy*, 1952; C. A. Mace (ed.), *British Philosophy in the Mid-Century*, 1957.

See also the various philosophers and the various systems, particularly, of the former, ARISTOTLE; BACON; COMTE; DESCARTES; FICHTE; HEGEL; HERBART; HUMER; KANT; LEIBNITZ; LEWES; LOCKE; LOTZE; NIETZSCHE; PLATO; SPENCER; SPINOZA; and, of the latter, DUISM; EXISTENTIALISM; IDEALISM; POSITIVISM; MATERIALISM; OPTIMISM; PESSIMISM; TRANSCENDENTALISM, etc.

Philosophy, Social, see SOCIAL PHILOSOPHY.

Philostatus (d. 224/9), Gk sophist and rhetorician. After teaching at Athens he came to Rome in the train of the empress Julia Domna, at whose request he wrote the *Life of Apollonius of Tyana*. Other works certainly by P. are *Lives of the Sophists* and the first collection of *Imagines* (descriptions of pictures). There is an ed. with trans. of these works by F. C. Conybear, W. C. Wright, and A. Fairbanks (Loeb Library), 4 vols., 1912-31.

Philotas (d. 330 BC), Macedonian soldier, son of Parmenion (q.v.). While P. was serving in Media he was accused of treason, and his action having implicated Parmenion, father and son were executed.

Philoxenus: 1. (436-380 BC) Gk dithyrambic poet, b. Cythera. He spent part of his life at Syracuse, where he lived at the court of Dionysius the Elder. Only

a few fragments of his poems have come down to us. See J. M. Edmonds, *Lyra Graeca* (with trans.), 1922.

2. (fl. 316 BC) Eretrian painter remarkable for the rapidity with which he worked. His greatest work was a picture of the battle between Alexander and Darius, painted by order of Cassander, King of Macedon.

Phintias, see LICATA.

Phips, or Phipps, Sir William (1651-95), first royal governor of Massachusetts, b. Pembaquid, Maine. In 1687 he rescued treasure to the value of £300,000 from a Sp. wreck, and was rewarded for his services with a knighthood and appointed a sheriff of New England. He captured Port Royal in 1690, but failed in his attack on Quebec (1691). He was appointed governor of Massachusetts in 1692. See life by Bowen in *Spark's American Biography*, 1834-7, and lives by H. O. Thayer, 1927, and Alice Lounsberry, 1941.

Phiz, see BROWNE, HABIOT KNIGHT.

Phlebitis, inflammation of a vein. It is generally caused by the extension of inflammatory processes from neighbouring tissues, and results in the formation of a thrombus or clot in the course of the vein. This clotting is attended with particular danger, as if it becomes detached from any cause, septic emboli or masses of infected fibrin are carried away in the bloodstream and may lodge in an important organ. Here they may cause dangerous inflammation through an infectious process, or obstruct the circulation. Thus an embolus may reach the brain and cause sufficient vascular disturbance in the cerebral region to produce paralysis and death, or it may lodge in the lung and cause a pulmonary embolism. The symptoms of P. are pain, tenderness, swelling, and oedema of the affected part and a cordy appearance of the vein itself.

P. is often associated with varicose veins of the leg.

Phlebotomy, see BLEEDING and VENE-SECTION.

Phlegethon (Greek for flaming), a riv. of fire encircling the infernal regions and emptying into Lake Acheron.

Phlegm, mucous secretion, with impurities such as dust and bacteria, expelled by coughing from the lower air passages.

Phloem, see BAST.

Phlogiston Theory, in chem., a theory of combustion elaborated by J. J. Becher (1635-82) and G. E. Stahl (1660-1734). According to this theory, all combustible bodies contained a 'principle of combustion,' *phlogiston*, which they gave up to the air or to other bodies when burnt. Though the P. T. was enthusiastically supported by Eng., Ger., and Fr. chemists in the 18th cent., it was overthrown by the work of Lavoisier (q.v.), who showed that on combustion a burning body combined with atmospheric oxygen and that the products weighed more than the original substance. See E. J. Holm-yard, *Makers of Chemistry*, 1931.

Phlorizin (Greek *phloios*, bark; *rhiza*, root), glucoside found in the bark of the roots of sev. allied plants, such as the apple, pear, and cherry.

Phloroglucinol, or symmetrical trihydroxybenzene,  $C_6H_3(OH)_3$ , colourless crystalline solid (melting point  $218^\circ C.$ ), formed by fusing resorcinol (q.v.) with caustic potash in the presence of air. It gives a dark violet colour when treated with ferric chloride solution. It is used as an analytical reagent.

Phlox, family Polemoniaceae, genus of herbs, chiefly Amer.; of which *P. drummondii* and varieties are grown as half-hardy anns.; *P. paniculata* and hybrids as border plants; and *P. subulata* as a dwarf species; in gardens.

